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THE

SIXTH, SEVENTH, AND EIGHTH

ANNUAL REPORTS

OF

THE BOARD OF PUBLIC WORKS,

TO THE

General Assembly of Virginia:

ALSO, A COLLECTION OF

ACTS AND RESOLUTIONS

OF

THE GENERAL ASSEMBLY,

Passed at the Sessions of 1821—'22, 1822—'23, 1823—'24,

AND OTHER DOCUMENTS,

ON SUBJECTS CONNECTED WITH

THE FUND FOR INTERNAL IMPROVEMENT.

VOL. III.

RICHMOND:
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....
1824.

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PART I.

SIXTH
ANNUAL REPORT
OF THE
PRESIDENT AND DIRECTORS
OF THE
BOARD OF PUBLIC WORKS,
TO THE
LEGISLATURE OF VIRGINIA:

IN PURSUANCE OF AN ACT, ENTITLED, "AN ACT CREATING A FUND FOR INTERNAL IMPROVEMENT."

RICHMOND:
Printed by Thomas Ritchie, printer for the Commonwealth.
1821.

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.
R 1910 L

DECEMBER 27, 1821.

SIR,

I have the honor, through you, to lay before the General Assembly, the Annual Report of the Board of Public Works, which shows the state of the fund for Internal Improvement, at this time, and the certainty of a diminution in the charges upon it, under existing appropriations, to the amount of eighty-two thousand five hundred and fifty dollars, in the year 1824. The Report renders an exact account of the proceedings of the President and Directors in the last year, now terminating. It is accompanied by documents which shew the general progress of Internal Improvement by Canals, Roads and Bridges in that year.

I have the honor to be,

Sir, your most obedient servant,

TH: M. RANDOLPH.

The honorable the Speaker of
the House of Delegates.

REPORT.

The president and directors of the Board of Public Works, in obedience to the act entitled, "an act to create a fund for internal improvement," beg leave to report to the General Assembly, that the fund for internal improvement consisted, on the 15th day of December, 1821, of the following stocks, viz:

PERMANENT FUNDS.

125½ shares of stock in the Little River turnpike company,	$ 12,550 00
70 shares of stock in the Dismal Swamp canal company,	17,500 00
125 shares of stock in the Appomattox canal company,	12,500 00
70 shares of stock in the Potowmac canal company,	31,111 11 1-9
250 shares of stock in the James River canal company,	50,000 00
7947 shares of the stock of the Bank of Virginia,	794,700 00
3334 shares of the stock of the Farmers' Bank of Virginia,	333,400 00
900 shares of the stock of the Bank of the Valley,	90,000 00
231 shares of the stock of the North Western Bank of Virginia,	23,100 00
82 shares of the stock of the Swift Run Gap turnpike company, transferred to the Board of Public Works by an act of the last legislature,	4,100 00
Total amount of permanent funds,	$ 1,368,961 11 1

DISPOSABLE FUNDS.

Stocks acquired by the application of the income of the fund for internal improvement, and disposable, according to the 13th section of the act creating the fund for internal improvement, viz :

375 shares of the stock of the Bank of Virginia,		$ 37,500 00
186 shares of the stock of the Dismal Swamp canal company,		46,500 00
800 shares of the stock of the Roanoke canal company, on which was paid prior to the 15th day of December, 1820,	$ 44,000 00	
And since that period,	8,000 00	
		52,000 00
710 shares of the stock of the Bank of the United States :		
500 shares of which were loaned to the Dismal Swamp canal company,		
210 remaining,		21,000 00
35 shares of the stock of the Farmers' Bank of Virginia,		3,500 00
50 shares of the stock of the Bank of the Valley,		5,000 00
34 shares of the stock of the James River canal company,		6,800 00
1000 shares of the stock of the Richmond Dock company, on account of which was paid prior to the 15th day of December, 1820,	$ 25,000 00	
And since that period, in full of the 3d instalment,	12,500 00	
And in full of the additional requisition authorised by an act of the last session,	12,500 00	
		50,000 00
672 shares of the stock of the Leesburg turnpike company, on which was paid prior to the 15th day of December, 1820,	$ 8,400 00	
And since that period,	8,400 00	
		16,800 00
Amount carried forward,		$ 239,100 00

Amount brought forward,		$ 239,100 00
920 shares of the stock of the Swift Run Gap turnpike company, on which was paid prior to the 15th day of December, 1820,	$ 11,500 00	
And since that period,	11,500 00	
		23,000 00
480 shares of the stock of the Falls Bridge turnpike company, on account of which, nothing has yet been paid.		
140 shares of the stock of the Monongalia Navigation company, on account of which, nothing has yet been paid.		
50 shares of the stock of the Cartersville Bridge company, on account of which, has been paid,		2,250 00
		264,350 00
Add to this, 500 shares of United States Bank stock, loaned to the Dismal Swamp canal company, to be returned in kind,	50,000 00	
And this sum loaned to the same company, in pursuance of an act of the last session,	12,500 00	
		62,500 00
Total amount of disposable funds,		$ 326,850 00
Total fund for internal improvement invested in stocks paid for, and in loans,		$ 1,695,811 11 1-9
Upon the productive part of this fund there has been received since the 15th day of December, 1820, the following sums, viz:		
From the Farmers' Bank of Virginia,		$ 17,643 50
Amount carried forward,		17,643 50

Amount brought forward,	$ 17,643 50
From the Bank of Virginia,	43,466 00
From the James River canal company, for dividends,	3,816 00
From the United States' Bank,	315 00
From the Dismal Swamp canal company, for dividends on United States' Bank stock, loaned them,	750 00
From the Little River turnpike company,	1,506 00
From the Swift Run Gap turnpike company,	1,305 12
From the Bank of the Valley,	2,180 26
And from other sources there have been received the following sums, viz:	
From Th: Moore, the engineer, the balance unexpended of money advanced to him for paying the expences of surveys,	116 34
From the James River canal company, on account of their surplus income of the year 1820, which is specifically appropriated to reduce the certificates of loan issued by that company when the same can be purchased at par,	5,370 59
Add balance in the treasury, 15th December, 1820,	24,287 21
	$ 100,756 02

Out of which have been disbursed since the 15th day of December, 1820, the following sums, viz:	
On account of the map, by order of the executive,	$ 9,000 00
For pay and mileage of the members of the board,	2,132 01
Amount carried forward,	$ 11,132 01

Amount brought forward,		$ 11,132 01
To the Richmond dock company, for the third instalment,	$ 12,500 00	
To ditto for additional requisition,	12,500 00	
		25,000 00
To the Roanoke canal company, 6th requisition,		8,000 00
To the Swift Run Gap turnpike company, 2d instalment,		11,500 00
To the Leesburg turnpike company, 2d instalment,		8,400 00
Loaned to the Dismal Swamp canal company,		12,500 00
To the Cartersville bridge company,		2,250 00
To Thomas Moore, engineer, on account of salary,		2,625 00
To ditto, on account of expenses of surveys in 1821,		1,000 00
To Bernard Peyton, secretary, on account of salary,		777 75
To the door-keeper,		97 50
For printing and binding,		128 37
For Books,		52 32
For stationery and postage,		16 53
For advertising,		12 25
For a sextant,		40 00
For an express,		18 00
		$ 83,549 73
Balance in the treasury, 15th December, 1821,		$ 17,206 29
Of which, $ 5,370 59 is applicable to the purchase of the certificates of the James River loan,		$ 5,370 59
And the balance to the ordinary purposes of the fund for internal improvement,		$ 11,835 70
The charges upon the income of the fund for internal im-		
Amount carried forward,		$ 11,835 70

Amount brought forward,	$ 11,835 70
provement for the succeeding year, will probably be as follows, viz:	
Further instalment to the Roanoke navigation company, say,	14,400 00
Last instalment to the Richmond dock company,	12,500 00
Third instalment to the Swift Run Gap turnpike company,	11,500 00
Third instalment to the Leesburg turnpike company,	8,400 00
Loan to the Dismal Swamp canal company,	25,000 00
Last payments to the Cartersville bridge company,	2,750 00
To the Monongalia Navigation company, say,	5,000 00
On account of the map of Virginia,	9,000 00
	$ 88,550 00
To which is to be added, for the ordinary expenses of the board, including officers' salaries, expenses of surveys, &c. say,	$ 7,000 00
	$ 95,550 00
And also the further sum of $ 18,000, to be set apart for the purchase of certificates of the James River loan,	$ 18,000 00
	$ 113,550 00
To meet which charges, the resources of the fund for internal improvement will probably be as follows, viz:	
The balance in the treasury applicable to general purposes,	$ 11,835 70
Amount carried forward,	$ 1,835 70

Amount brought forward,	$ 11,835	70
Balance now due from the Bank of the Valley,	9,594	74
Balance now due from the North Western Bank of Virginia,	2,425	50
Balance now due from the James River company, for dividends of July, 1821, on 250 shares of stock,	3,000	00
Dividends of 1821, on stock of the Bank of the Valley, say,	5,700	00
Dividends on stock of the North Western Bank of Virginia, say,	921	00
Dividends on James River stock,	6,816	00
Dividends on Farmers' Bank stock,	20,214	00
Dividends on stock of the Bank of Virginia,	49,932	00
Dividends on stock of the Bank of the United States, held by the board, and loaned to the Dismal Swamp canal company, say,	4,260	00
Dividends on stock of the Little River turnpike company,	753	00
Dividends on stock of the Swift Run Gap turnpike company, say,	205	00
Interest on loan to the Dismal Swamp canal company,	1.125	00
	$ 116,781	94

In making the foregoing statement, the president and directors of the Board of Public Works, have stated the charges against the income of the fund for internal improvement, for the next year, at the greatest sums which can, with any degree of probability, be called for; indeed, it is most probable, that the charges will not be so great as stated.

The payments to the Richmond dock company, and to the Cartersville Bridge company, will be completed in the year 1822, and the loan to the Dismal Swamp canal company in

1823, will be only $ 12,500; consequently, the charges under existing appropriations, upon the income of 1823, will be less than the charges of 1822, by $ 27,750. And in 1823, the payments to the Leesburg Turnpike Company, the Swift Run Gap turnpike company, the Roanoke Canal company, and on account of the map, will also be completed; so that the charges (under existing appropriations,) on the income of 1824, will be less than those of 1822, by the sum of $ 82,550.

On the sixth day of February, 1821, which was the last day of the session of the Board ot Public Works last winter, the board proceeded to prescribe the duties of the engineer for the then ensuing season, by resolutions; a copy of which accompanies this report, marked A.

In pursuance of those resolutions, the engineer, during the last season surveyed and examined the Appomattox river, the Little Roanoke, and the country between them, the Little Kanawha, the Clinch, and Powell's rivers; his report of those surveys and examinations accompany this report, marked B. The engineer hath also, since the last annual report of the president and directors of the Board of Public Works was made to the General Assembly, examined the Chickahominy river; his report of that examination is annexed, marked C. The execution of the residue of the said resolutions, and of the resolution of the General Assembly, in relation to Cheat and Shaver's rivers, has necessarily been postponed until the next season, when they will be attended to.

For the purpose of carrying into effect various acts of the General Assembly, passed subsequent to the adjournment of the Board of Public Works last winter, a meeting of the board was called by the president, and held on the 20th day of June last; at that meeting the board, in pursuance to the several acts of Assembly to that effect, authorised a loan to be made to the Dismal Swamp canal company of $ 50,000, upon the terms prescribed by law. They also authorised the payment of an additional requisition on the stock of the Richmond dock company, amounting to $ 12,500. They also authorised the payment of two-fifths of the expences of laying out and marking a road from the town of Beverley, to the nearest point on the upper navigable part of James river, provided the whole expense should not exceed $300. They also authorised a subscription for 140 shares of the stock of the Monongalia navigation company, and 50 shares of the stock of the Cartersville Bridge company. The board at that meeting, also adopted resolutions, a copy of which is annexed, marked D, upon the subject of the appointment and duties of a collector, and appointed Anthony Robinson, junior, who having given the bond and security required, which was approved by the board, entered upon the performance of the duties of his office, and has discharged them satisfactorily. The board at the same meeting, entered into a resolution in relation to the investing of the surplus income of the James river company, a copy of which is annexed, marked E. It appears, that no certificates of the James river loan are offered for sale, and it is probable, that those certificates will not be offered for sale, to any considerable extent, as it is understood, that the company have borrowed money at five and a half per cent. It is, therefore, respectfully suggested, whether it would not be better to invest the surplus income of the James river company, and the annual appropriation from the fund for internal improvement, appointed for the redemption of the certificates of James river loans, in some productive fund, until they may be wanted for the payment of interest on the certificates of James river loans, or until an opportunity offers for investing them as prescribed by law, rather than to permit them to remain unproductive.

In the month of June last, William Paxton, esq., resigned his appointment as a member of the Board of Public Works, and the board appointed Gen. James Breckenridge to supply the vacancy, who declined accepting the appointment.

Reports from the Appomattox canal company, the Dismal Swamp canal company, the Fall's Bridge turnpike company, the Potowmack company, the Little River turnpike company, the Monongalia navigation company, the James river canal company, the Swift Run Gap turnpike company, the Richmond dock company, the Leesburg turnpike company, and the Cartersville bridge company, accompany this report.

No report has been made by the Roanoke canal company, but the Board of Public Works have received satisfactory information, that the canal and locks at present contemplated at the falls, will be completed by the next summer. In relation to the amendments to the laws concerning the Monongalia navigation company, suggested in a paper accompanying the report of that company, the Board of Public Works have not at present, sufficient information upon which to form a satisfactory opinion. This, however, will probably be the subject of some further communication to the General Assembly.

The Board of Public Works cannot close this report, without expressing their regret, that whilst many other important public works in Virginia, are prosecuted with vigour and success, nothing has been done effectually, during the last summer, towards the examination of the Potowmack river, as directed by the act of the last session: a large district of Virginia is deeply interested in the further improvement of the navigation of that river; the improvements now in progress, and nearly completed on the Shenandoah, and other improvements contemplated upon several water courses in Virginia, which fall into the Potowmack, will be in a great degree fruitless, until the navigation of the last mentioned river shall be further improved.

TH: M. RANDOLPH, *President.*

BERNARD PEYTON,
Sec'y. B. P. Works.

(A.)

Extract from the Journal of the Board of Public Works of the 6th of February, 1821, *when the following report and resolutions were adopted :—*

The committee appointed to prescribe the duties of the engineer during the present year, have had that subject under consideration, and beg leave to report:

That in consequence of various acts and resolutions of the General Assembly, and resolutions of the Board of Public Works, the following objects claim the attention of the board.

The survey of the country between the Appomattox and Staunton rivers, with a view to connecting them by a navigable canal.

The survey or examination of the Clinch river, from the junction of the North Fork and Maiden Spring, to the Tennessee line, and of the Powell's river, from the Tennessee line to the highest point to which it is susceptible of navigation.

The survey between the Nansemond river and the Black Water river, and Summerton creek, in order to connect the two rivers by a canal.

The examination of the Little Kanawha, from the great falls to the Ohio, with a view to improving the navigation thereof.

The examination or survey of the south branch of the Potowmac, the Great Capecapon river, the North river, and Patterson's creek, from their mouths to the highest points susceptible of navigation by boats.

The examination of Tygert's Valley river, in like manner.

The examination or survey of the Roanoke and Rappahannock rivers above the falls, to the highest points susceptible of navigation.

In addition to the foregoing objects, the engineer is required by a law of the present session, to attend the joint commissioners of Virginia and Maryland, for the examination of the Potowmac: and your committee are of opinion that whatsoever other duties may be assigned to the engineer for the present year, they should give way to this duty assigned by the legislature, whensoever the engineer shall be called upon by the said commissioners to attend them.

The committee have come to the following resolutions:—

1. *Resolved,* That the principal engineer do, in the course of the present season, survey the route of the contemplated canal between the Appomattox and Staunton rivers, as required by the act of Assembly on that subject: *Provided,* some person or persons will come under obligations to the members of the board, ex-officio, to defray the expense of such survey.

2. *Resolved,* That the engineer do, in the present season, examine the Clinch, and Powell's, and Little Kanawha rivers, as directed by the resolutions of the General Assembly in relation thereto: and that he do, in the interval between the examination of Clinch and Powell's rivers, and the Little Kanawha, attend the Kanawha commissioners, and give them any aid which they may require, at the expense of the James river company: *Provided,* That such attendance shall not defeat the other objects of this and the foregoing resolutions.

3. *Resolved,* That the other surveys and examinations mentioned in the preamble to these resolutions, be executed by the engineer so soon as circumstances will permit, in the order that he shall find most convenient, or may be directed by the members of the board, ex-officio, in the recess of the board.

A true copy.

BERNARD PEYTON,
Sec'y. B. P. Works.

TO THE

BOARD OF PUBLIC WORKS,

FOR THE

STATE OF VIRGINIA.

In compliance with the instructions of the board, dated the 6th of February, 1821, and of those afterwards received from the members ex-officio, dated the 21st of March, so soon as I supposed the early spring freshets had sufficiently subsided for the purpose, I left home in order to enter on the examination of the Appomattox, and to execute the survey for the contemplated canal between that and the Staunton rivers. But in consequence of the unusually great falls of rain, the river was too high to make a beginning until the 7th of the 5th month; and subsequent to that time, the progress of the work was much interrupted by wet weather and high water.

On becoming in some degree acquainted with the character of the river, and finding that a diversity of opinions existed relative to the most eligible mode of improvement, I became convinced that a mere view of its bed would not enable me to give such description of the several kinds of improvement of which it is susceptible, and such estimates of expense incident to each, as would be satisfactory to those concerned. I therefore ventured with the approbation of the committee of the town of Petersburg, to depart so far from the letter of my instructions as to make a survey, and take the levels from the head of the canal to Farmville. This has made me fully acquainted with the subject, and given me the materials for forming such a report as I hope will be satisfactory to the board, and to those immediately interested.

The Appomattox, from the head of the canal to Farmville, measures 90 miles 202 perches.—Few streams, that are not larger where they meet the tide, passes so much water at the same distance above, as this does at Farmville. The whole fall between the points mentioned, is 165 feet 10 inches, averaging about 22 inches per mile. In the whole distance, there is not one considerable abrupt fall at any one place. It may, therefore, be considered favorable for the purposes of navigation in the bed of the river in proportion to its size.

There are at present four mill dams across it of different heights, making in the whole 42 feet 3 inches fall, and 19¼ miles of slack water. Each of these dams is furnished with locks for the passage of boats. At most of the falls between and below the dams, something has been done to render the navigation more easy and safe. In its present state, it is useful and important; but the fertility of the country through which it passes, and the rich counties south and west of Farmville, imperatively demand a more certain, and if practicable, a cheaper mode of transporting their bulky products to market than is now offered by means of the river.

To effect this object, four different plans present. The first is to render the present stream navigation more perfect, and will be first considered.

In this description of navigation, the fall is to be overcome by means of men operating with setting poles, or hauling with ropes. It is therefore necessary, that the passage for the boats should be in every part so graduated as to enable the usual number of men which are employed to navigate a loaded boat down the river, to ascend with at least one third of a load.—My experience goes to prove, that for this purpose the descent ought not at any place to be greater than 6 inches fall to the 100 feet in distance. When the men have the advantage of a towing way, the boat might be hauled up a steeper ascent; but this interferes with another important consideration in small rivers; which is, that it will require more water; because the greater the angle of descent, the greater will be the velocity of the current; and of course, when the whole water of the river is confined to a sluice of a given width, the depth of water will be less where the descent is one foot to the hundred than where it is only six inches.

Sluices ought to be wide enough for two boats to pass each other; otherwise, accidents might sometimes occur. For the boats in present use, they ought to be 16 feet wide. Then supposing a boat laden with 10 hogsheads of tobacco, which is considered a full load, draws 20 inches of water, and the bed of the river in the best possible state of improvement on this plan, it will follow, that whenever there is water enough in the river to fill a canal 16 feet wide and 20 inches deep, flowing with the rapidity that will be given by a descent of six inches in the hundred feet, the river will be navigable for boats fully laden. And if we suppose freight to be so reduced as that six hogsheads will be the minimum quantity that can be carried to pay expenses, and that a boat containing that quantity will draw about 14 inches, then it will also follow, that when there is not water enough in the river to give 14 inches in a sluice of the width and flowing with the velocity before mentioned, that the river cannot be considered navigable.

From the best observations that I have been able to make, aided by the information derived from intelligent persons, well acquainted with the river, I am of the opinion, that on an average of seasons it may be safe to calculate on 6 months in the year of constant navigation; and that in the other 6, by taking advantage of partial risings from rain, about three more may be obtained.

In order to put the river in the situation just alluded to, it will be necessary to have it carefully examined throughout the whole length, and a connected boat way cleared. In many places where the depth is sufficient, the passage is interrupted by detached rocks which may be easily removed. Whilst this is performing it will be found, that there are many sections of shallow water of considerable extent, which may be made sufficiently deep by swelling the water by means of a pair of low jetties, or wings at the lower end, furnished with a sluice to moderate the current of the passage. At nearly all the falls, some additional labor will be necessary to turn the whole of the water, when low, into the sluices, and to improve these so as to render them perfectly safe, and afford something like an equality of depth and current through the fall. At present, many of them are very deficient in both of these requisites; as will appear from my notes taken on the spot; notwithstanding a considerable part of the work on this river, is executed with quite as much judgment as we usually find in such undertakings.

We have already seen that more than 19 miles is made navigable by four mill dams; and there are 27 miles that require so little improvement as to be scarcely worth noticing; leaving 44 to be improved; in 20 of which there are no material falls, and will not require expensive improvements; the other 24, will constitute the principal part of the expense. But in executing this kind of work so much depends on the skill and management of those who have the direction of it, that it is not possible to calculate the cost with a tolerable degree of certainty. If however these men could be persuaded, of what is certainly the fact, that for jetties and wings, and the sides of sluices, a row of brush intermixed with stone of any shape or size, or even coarse gravel, will answer the purpose intended in every respect better than the expensive walls of large stone which are commonly made for such purposes, a large proportion of the expense would be saved. Many of the falls in this river are attempted to be improved by removing some rocks for a boat passage, and then checking the water by wings or jetties extending from each shore, leaving an opening between their points for the boats to pass; of these there are from 3 to 6 pair to a fall, each of which forms an abrupt fall or pitch of the water very hard to ascend. In several instances where the river is wide, one of these walls is nearly as long as the whole length of the fall, and therefore, a pair of them, if placed parallel to each other at a suitable distance asunder and in the proper direction, would have formed a sluice which would be perfectly safe, and much easier to ascend, and the expense of forming the other walls might have been saved. It may also be observed, that some of the most dangerous places in the river, are occasioned by an injudicious arrangement of these wings, and the openings between them, as may be seen in the notes: Whereas in sluices properly constructed, there never can be danger in any stage of the water.

If these errors are avoided and proper economy used, I am of opinion that an average of 75 dollars per mile, for the 20 above-mentioned, and 200 dollars per mile for the 24, making in the whole 6,300 dollars, will effectuate as good a navigation as can be expected from this mode of improvement.

The narrowness of this river, and the smallness of the fall, render it peculiarly favorable to improve by means of low dams and sluice gates; which may be considered the second grade of improvement; and is effected by constructing a great number of low dams, each furnished with a falling gate. When they are full, and boats are to pass the gate of the first (which is attached by hinges to the sill) is let down, and the water rushes out over it, giving a sufficient depth for all the boats that are in readiness to pass through, and to float them down to the next dam, where the same thing is repeated and so on as far as the depth requires this kind of artificial aid. As the gates are at present constructed, this kind of navigation is only calculated for short rivers, or those on which the products to be transported are principally collected at one place, near the head of the navigation; that all the boats engaged in the trade, may prepare to start at the same time, in order to take advantage of the artificial depth produced by the opening of the sluice gates. For, as the gates are made to open downwards, the pressure from above, and the rapidity of the current, prevent their being raised until an equality of levels is nearly restored by the settling of the water in the ponds. And therefore, unless persons were employed to watch the dams and raise the gates when the water will permit, no other boat could pass until those below returned from market and raised the gates after passing up. These returning boats are also liable to detention; for, if the water should be very low, there may not be depth enough in many places for empty boats, and if partly loaded, might be stopped altogether. And if after the returning boats have raised the gates, a boat should start from some point below the general rendezvous, then those from above on coming to this point will be stopped in consequence of all the dams below being empty.

I am, however, clearly of opinion, that by a small additional expense, these gates can be made to raise with perfect ease by the labor of one person, immediately after the passing of a downward boat. If this improvement was to be adopted, the plan would then be, to erect the dams at such distances apart as to make navigable water from one to the other when full, except what might be gained by a short sluice below each. To explain this, we will suppose a dam erected which makes good water to the foot of a ripple; it would not then be necessary to place the next immediately at the head of this back water, but at some convenient distance, say 100 feet or more up the ripple. Over this distance the water must be confined in a sluice, and by this means, six inches or more may be frequently gained. But, as ascending boats must always stop at the lower end of each sluice, for a man to walk up to let down the gate, and a person return from a descending one to raise it, the distance ought not to be so great as to render it inconvenient. It would then become the duty, and ought to be enforced by *law*, for every head man or master of a boat, to leave every gate raised after passing through, either in ascending or descending, except when the natural stream was competent to give sufficient depth; in that case they should all be left down.

If this plan was completely executed, and proper regulations for the boatmen adopted and enforced, the water must be extremely low, or the trade very great, if any scarcity should ever occur. But as the number of dams and gates must necessarily be great, notwithstanding the fall of the river may be considered moderate, the detention in passing them would be considerable. There will also be a liability to detention from curious and mischievous persons opening the gates, and unless the whole is executed in the best manner, some of them will occasionally give way, and may stop the navigation until repaired.

After deducting the fall of the four dams, and allowing something for the fall on the surface on the small ponds made by the sluice dams, I think it probable, that about 105 feet will remain to be overcome by dams and sluices, which if properly located, may be made to average 21 inches each.—This will require 60 in number, and may be stated at $200 each. After some experience has been acquired, I think they ought to be constructed for a less sum; yet as much depends on having them executed in the very best style, it will perhaps be safest to allow this sum in the estimate. The whole amount will then be $12,000. For the improvement proposed in the gates, see my report of last year on the Pamunkey river; and for the general plan of constructing the dams and sluices, and other works in the beds of rivers, see my report on the James river for 1818, and on the Potomac of last year.

The third plan of improvement, is, by means of dams and locks so arranged, as that one dam always gives a sufficient depth quite up to the lock sill next above.

If the dams are tight, and the locks kept in repair, this plan is certain to give good navigation at all times, with the advantage of always having slack water for ascending; whereby the same number of hands will be able to take up much larger loads. But, as the current will be diminished, the time taken for descending will be increased, and altho' much larger loads may be taken up, yet it is not probable, it will be done in less time, as the poling in very deep water is more inconvenient than in shallow, and balances the disadvantages of a tolerably brisk current. An objection is made to this plan on account of the liability of the dams and locks to get out of repair; for, if one should become impassable, it destroys the navigation above until repaired. I think, however, that if the dams are well executed on the plan proposed in my report on the James river in 1818, there will not be much to apprehend from them for many years. The best description of wooden locks (which are the kind I would recommend for this navigation) will require but little repairing for 10 or 12 years, when some of the timbers will probably require renewing. But if a regulation was adopted, suspending the navigation a few days at a particular time in each year, for the purpose of repairing, and materials always kept in readiness, the probability is, that disappointments would rarely take place on this account.—Another objection is made on the supposition, that the low grounds on the river would be much oftener overflowed. If the dams are properly proportioned to the heights of the banks, this effect will not be produced, for the reasons given in the report last alluded to, as constant experience abundantly proves. Fears are also entertained, that they may make the country unhealthy. But where water is confined in the banks of a river, (as it would always be in this case, except in great freshets,) I believe dams have not been known to affect the health of neighborhoods.

In addition to the dams already built, 14 more will be required, averaging 8 feet each. These, if built in the most substantial manner, on the plan before mentioned, and the abutments and banks below properly secured, will probably cost about $ 1,200 each; and my estimate for the best kind of wooden locks is $ 1,000. The whole cost of improving on this plan may, therefore, be about $ 30,800. If it should be adopted, the company ought to have the most perfect controul over the works. I should suppose the better plan would be, for the company to erect them, and rent or sell the spare water, instead of permitting individuals to erect them as a consideration for the use of the water. The present state of things on this river, abundantly proves the impolicy of the latter plan.

The fourth, and which is by far the most valuable description of internal navigation, is an independent canal along the ravine of the river. For this purpose, the land on the north side of the river, is better than any I have seen for the same extent. There are but very few places where rocky hill points approach the river. All the sections taken together, which will require supporting walls for the canal, will not amount to half a mile; and of what may be called expensive excavation, to very little more. The tributary streams on that side are all small, and present no serious difficulty in crossing. As the line for a canal was not traced out by the instruments, the exact length is not known; but it is quite certain, it would be considerably shorter than the river. For the same reason, the precise quality of the ground for each mile as relates to excavation is not ascertained; but I think I am well enough acquainted with it to be sure that the following estimate is a safe one for the present time:

85 miles of 3 feet cutting, at 10 cts. per cubic yard, - - -	$ 119,680 00
4 miles of 4 feet cutting, at 15 cents per cubic yard,	11,265 00
Amount carried forward,	$ 130,945 00

Amount brought forward,	$ 130,945 00
1-2 mile of 6 feet cutting, at 25 cents per cubic yard,	3,520 00
1-2 do. walling, filling, &c.	6,400 00
20 locks of 8 feet, 3 inches lift each, at $ 5,000,	100,000 00
For culverts and bridges, at $ 600 per mile,	54,300 00
Sluices, embankments, &c.	20,000 00
	315,165 00
Engineers, superintendants, and contingencies, 10 per cent,	31,516 00
	$ 346,681 00

This estimate is made for a canal 30 feet wide on the water line, 18 feet at bottom, and 3 feet deep; and for locks 75 feet long, and 12 wide in the clear, built in a substantial manner of stone, faced with cut free stone or hewn granite.

In the three former plans, the price of transportation would not vary very materially. The same description of boats would be used for the first and second—the third would admit of a larger size, but would require more men, and be longer in making a trip. The present price is $ 5 per hogshead, and 42 cents toll.

On such a canal as is proposed in the fourth plan, one man, a boy and a horse, will carry 36 hogsheads of tobacco from Farmville to Petersburg, and return in 8 days. The cost of transportation may be as follows:

One respectable man,	8	days, at	$ 1 25,	$ 10
One boy,	8	do.	50,	4
One horse,	8	do.	50,	4
				$ 18
Boat for the trip,				5
				$ 23

I suppose at present for every 36 hogsheads of tobacco that passes down, there must certainly be one ton of merchandize returned (which will not average more than 4 or 500 lbs. each for the boats now in use.) It is not to be expected, there will be less when it will be carried cheaper; and as a very large proportion of the lands which furnish tobacco for Farmville inspection, would be vastly improved by the use of plaister of Paris, it is fair to suppose, that if it could be obtained at a low price, immense quantities would be taken up this navigation. I will suppose that each planter who raises 36 hogsheads of tobacco only to use two tons, which is very much below what I believe would soon be applied, and the transportation to Farmville only $ 3 per ton (the price that is paid for 20 miles of land carriage in the way of back load,) then it may fairly be supposed that each returning boat of 36 hogsheads would carry

One ton of merchandise at	$ 5
And 2 tons of plaister at $ 3,	6
	$ 11

which deduct from the expense of the trip, and it leaves $ 12, or 33 1-3 cents per hogshead.

If nothing more was obtained than the certainty of carrying the products of the country to market at any time in the year with perfect safety, and merchandize returned with equal certainty, even at the present prices it would be a great thing gained; but if instead of $ 5 42, the present cost of transportation, we add to the canal rate a toll of $ 3 67, making the whole cost $ 4, saving on the present rate $ 1 42; then the carriage of 5,200 hogsheads will pay 6 per cent. on the capital.

At present, owing to the uncertainty of the navigation and high freights, a large proportion of the products that are raised on this river and its branches, and the country adjacent, are carried to market by land. It appears to be the opinion of many of the most intelligent men in the neighborhood of Farmville, and to the south and west of that place, that if the navigation was in such a state as to command the whole of this trade, the tobacco, wheat, flour and other articles transported on it would form an aggregate more than equal to 5,000 hogsheads the first year it was opened, and that if the contemplated connection between this river and the Staunton was completed, the quantity would be encreased to a vast amount; in which case it is probable, that the tolls might be so reduced as to leave the cost of transportation at less than half of what it is at present. This would have the effect to increase the number of articles transported, and to invite them from a greater distance.

Having now given a short description of each of the several plans which have presented for the improvement of the Appomattox, and an estimate of the expense incident to each, I shall close this report with just observing, that in case the latter plan should be attempted, it would perhaps be advisable to expend, at an early period, about one half of the sum estimated for the first plan, in improving some of the worst places, and giving an increased depth on some of the shoals. This expenditure would probably be fully remunerated by the advantages derived during the preparation for, and the execution of an independent canal.

THE CONNEXION BETWEEN THE APPOMATTOX AND STAUNTON RIVERS.

The most eligible plan for effecting this object, appears to be by means of a canal along the ravine of Buffaloe creek (which unites with the Appomattox 276 perches above Farmville) as far as that stream will supply a sufficiency of water to feed the canal. Then crossing the dividing ground by a short portage to the highest point on the Little Roanoke, from whence a sufficient supply can be drawn to feed a canal; to be continued down the valley of the last mentioned stream to the Staunton river, or, to such a point on the Little Roanoke as will, at all times, be accessible by boats from the Staunton along the bed of the stream.

By a careful examination of this water course at the time the survey was made, added to such information as could be obtained, from those who have frequently noticed it at all seasons, and from its capacity for propelling mills when very low (of which I had some opportunity of ascertaining,) I am of the opinion, that it will not be safe to depend on it for supply of a canal at any point above its junction with Buckles Branch: but that branch may be taken in by a small canal, and delivered into the Little Roanoke a considerable distance above the present junction, as represented on the map accompanying this report.

From the same kinds of evidence I am also inclined to believe, that Buffaloe creek cannot be relied on for supplying a canal, in dry seasons, higher than Dupey's mill; but the water may be taken from the millrace across the bed of the creek, and carried on a level line until it meets the south, or, Millstone branch, and thereby considerably shorten the portage. From this point of junction to the highest point before mentioned, on the Little Roanoke, the distance on a direct line is 2 miles 190 perches as represented on the map. The ground is favorable for a road, and there is no doubt but one may be made between those points, that shall every where be within the limit of 3 degrees of acclivity and declivity. But as it is probable a little meandering may be necessary, the whole length of the portage may be considered to be about two and three quarter miles.

The levels on the Little Roanoke were first taken. From the southern end of the portage to the tail race of Morton's mill, the fall is 36 feet 6 in. 6-8. The ground on both sides excellent for a canal. Thence to the lower end of Major Morton's farm, the same kind of ground, on the right, the fall, f. 6 in. 0 2-8. Then through Col. Morton's and Col. Carrington's land, to Dabbs' ford, the fall is 16 f. 9 in.

From the beginning to this place, the ground may be said to be of the easiest kind of cutting. There are, however, a few low places that will require some embankments, and also several places where the hill side is somewhat steep for short distances. I am of opinion that a calculation for 4 feet cutting at 12½ cents per cubic yard, will certainly cover the whole expenses of excavation and embankment to this place.

From the last mentioned point to Reed's bridge the fall is f. 19 in. 8 4-8.

On this section there will be some embankments, and the canal, in places circuitous. But the ground is of the best quality for excavation, except 2 or 300 yards, immediately above the bridge which is rocky and affords a suitable site for one or two locks.

From Reed's bridge to lower bridge (mostly through John Randolph's land) the ground is excellent, with very little if any embankment required. The fall is f. 1 in. 11. Then the same kind of ground continued to Flat bridge. The fall in this section is f. 7 in. 4 1-8.

From this place to Ward's Fork, the ground is of the best quality for excavation; and a choice of depth may every where be taken. Ward's Fork is nearly, or perhaps quite as large as Little Roanoke. It will probably be crossed by the canal a considerable distance above the junction; but neither the precise spot nor the mode of crossing can yet be determined. It is, however, most likely to be effected by a low dam. The ground continues good for some distance below the fork, and then becomes a little uneven in places, but presents no serious difficulty. The bank, for a few hundred yards, is tolerably steep; but appears to be composed entirely of earth. It is probable that a lock or two ought to be located at the lower end of this bank. From this place to the Massingford bridge, the ground is generally excellent. The fall from Flat bridge is f. 13 9 4-8.

Massingford bridge is at the head of Carrington's mill pond, from whence to the lower end of the tail race, the fall is

f. 8 6 1-8. Opposite to this place the bank is high and steep, and will require a wall 10 or 12 feet high, and about 8 perches in length. Then very good ground to the end of the canal, except a little steep bank, and a small embankment at the lower end of Cole's plantation. It is believed the canal ought to terminate at an old mill dam about a mile above the mouth of Little Roanoke, as it is said the water is always navigable to that point. The fall from the tail race above mentioned to this place is f. 9 3 6-8.

As the low grounds on this stream are in many places very extensive, the most eligible ground to be occupied by the canal cannot every where be determined by once passing over with the instruments. But the survey (which was taken along the valley on the north side of the stream near the foot of the rising ground) was so nearly on the trace, that will probably be adopted, that I am persuaded the difference in distance will be immaterial. By this survey, the length of the canal will be 22 miles 20 perches.

The greater part of this distance is of that kind of land where a choice of depth may be taken, and which would be about 2½ feet. But as there are some places where the cutting will necessarily be deeper, and some low embankments, which cannot be exactly estimated until the canal is actually laid out, for which something must be estimated ; I am of opinion that the estimate may be made at 4 feet cutting for the whole distance, at 10 cents per cubic yard. This calculation, I believe, will certainly be adequate to the completion of the canal, so far as relates to excavation and embankment.

The whole fall is f. 118 1 7-8—which will require 15 locks of nearly 8 feet each : supposing these to be 75 feet long and 12 wide. Where the foundations are good, and stone convenient, they may now be built for $ 5,000 each. But as there is some doubt as to foundations in some places, on this line, and stone not every where convenient, I think $ 5,500 each ought to be allowed for this item.

The dimensions of the canal, I think, ought to be 30 feet in the water line, 18 at bottom, and 3 feet depth of water ; furnished with a towing path of 10 feet on one side : In excavating such a canal, in 4 feet cutting, there will be 21,120 cubic yards ; which, at 10 cents, will be $ 2,112.

The estimate will then stand thus :

For excavating and embanking 22 miles ; 20 perches of canal at $ 2,112,	$ 46,782 00
15 locks at $ 5,500,	82,500 00
Amount carried forward,	$ 129,282 00

Amount bro't forward,	$ 129,282 00	
8 perches of supporting wall, backing, &c., at $ 220 per chain,	440 00	
For sluices, culverts and bridges, $ 700 per mile,	15,400 00	
Grubbing 3 miles at $ 400,	1,200 00	
		146,322 00
Engineers, superintendents, and contingencies, 10 per cent,		14,632 00
		$ 160,954 00

The levelling on the Buffaloe commenced at the northern end of the portage before described, and continued on the right side of the eastern fork about 3-4ths of a mile, down to its junction with the western fork. The fall in this distance is 23 feet 11 inches; then crossing over to the left side continued down to Baker's bridge; to which the fall is, from the place of crossing, 68 feet 0 6-8 inches; the distance from the beginning, 7 miles 37 perches.

The ground is generally good for a canal; there are, however, a few steep banks for short distances. I think a calculation of 3 1-2 feet cutting, at 12 1-2 cents per cubic yard, will cover the expense of excavating and embanking this far, except an extra expense of about $ 400, which will occur on a rocky hill side, for about 100 yards, where stone will probably be obtained for locks.

From Baker's bridge to Carter's mill dam, the levels and survey were taken on the right side of the stream, from a belief, that the most eligible ground would be found on that side; but, on further examination, it is now believed, that the crossing was unnecessary, that the ground on the left would not be more expensive, and that the distance would be shorter. But this has not yet been certainly ascertained; the estimate is therefore made for the ground that has been measured and examined. The expense of crossing at Baker's bridge, as explained in the notes, will be very little more than a continuation of the canal for the same distance. The length of this section is 3 miles and 77 perches. The fall to the surface of the water in the pond is 10 feet 9 5-8 inches. The ground to the head of the pond is generally good; but, there are a few places rather steep, with some appearance of rock. There are also several washes that will require small culverts. The ground which must be occupied along the margin of the pond is uneven, and will cause the canal to be very crooked. The hill side is in places steep, with some show of rock, which looks favorable for quarries. There are also some considerable washes, leading from the high ground, which will be troublesome. I think an allowance of 3 1-2 feet cutting at 12 1-2 cents per cubic yard, will execute the excavation and embankment; and $ 500 per mile the culverts. The crossing again to the left will be on the pond; and the mill race enlarged for a canal, the expense of which may be considered equal to the same length of a new canal on good ground: the fall from the pond to the tail race is, 8 feet 9 1-8 inches.

From Carter's mill dam to Morton's, or (as it is sometimes called) Legrand's bridge, the ground is mostly good, but, there are a few rocky places for short distances. I think a calculation on 4 feet cutting and 12 1-2 cents per cubic yard, will be sufficient for this section, including embankments and culverts; except about two chains of a rocky point, for which about $ 100 per chain extra may be allowed. The distance from Carter's mill dam to the last mentioned bridge, is 4 miles 179 perches: and the fall from the surface of the pond to the water at the bridge, 30 feet 3 4-8 inches.

From Morton's bridge to Appomattox river, the distance is 3 miles 1 perch, which is good ground, except about 4 chains (16 perches) of steep bank; this may be stated at 6 feet cutting, at 20 cents per cubic yard, and the remainder at 3 1-2 feet cutting, at 12 1-2 cents, including embankments and culverts. The fall in this section is, 18 feet 4 7-8 inches. The whole distance 17 miles 294 perches, and the whole fall 151 feet 5 6-8 inches.

The estimates for this canal will then stand as follows:

FOR THE FIRST SECTION FROM THE BEGINNING, TO BAKER'S BRIDGE.

7 miles 37 perches, of 3 1-2 feet cutting, will give 127,842 cubic yards, which at 12 1-2 cents is,	$ 15,980 25
Extra work,	400 00
Culverts at $ 200 per mile, say,	1,400 00
	$ 17,780 25

2nd. SECTION FROM BAKER'S BRIDGE TO CARTER'S MILL DAM.

3 miles 77 perches, of 3 1-2 feet cutting, will give 58,222 cubic yards, at 12 1-2 cts. is,	7,277 75
For culverts, at $ 500 per mile,	1,625 00
	$ 8,902 75

THIRD SECTION FROM CARTER'S MILL DAM TO MORTON'S BRIDGE.

4 miles 179 perches, of 4 feet cutting will give 49,629 cubic yards, at 12 1-2 cts. is,	12,036 75
2 chains of extra work, at $ 100,	200 00
	$ 12,236 75

4th. SECTION FROM MORTON'S BRIDGE TO APPOMATTOX RIVER.

2 miles 305 perches, of 3 1-2 feet cutting, will give 53,056 cubic yards, at 12 1-2 cts. is,	6,632 00
4 chains of 6 feet cutting, gives 1760 cubic yards, at 20 cts. is,	352 00
	$ 6,984 00

First section of the canal,	17,780 25
Second do. do.	8,902 75
Third do. do.	12,236 75
Fourth do. do.	6,984 00
	$ 45,903 75
For bridges and sluices, for nearly 18 miles, at $ 500 per mile,	9,000 00
1¼ mile grubbing, at $ 400,	500 00
19 locks of nearly 8 feet lift, each at $ 5,000,	95,000 00
	$ 150,403 75
Engineer's superintendence and contingencies, 10 per cent,	15,040 37
	$ 165,444 12
Canal and locks on the Little Roanoke,	160,954 00
2¾ miles of stone-capped road for the portage, at $ 4,000,	11,000 00
Total cost of the contemplated connection,	$ 337,398 12

It will be seen that the grounds on the Buffaloe are not so uniform in relation to the facilities they afford for the construction of a canal, as on the Little Roanoke: it was therefore necessary to divide it into sections, for the purpose of calculation. If the whole line of canal, on each stream, was actually laid out on the precise ground that they ought to occupy, so that they might be divided into very short sections, and a separate calculation made for each, where there was the smallest variation in the ground, the estimates would in many places, for short distances, vary from those above stated, but I am persuaded the difference in the general result would not be great: And I did not suppose that it would be expected either by the Board of Public Works, or those immediately interested, that more time should be devoted to this first, or experimental survey, than was necessary to furnish materials for forming a general estimate.

There are two plans, either of which would procure a water carriage the whole distance from river to river.

One is, to elevate the water from one of the points now proposed as the end of the portage, by means of a steam engine to supply a summit level, near the top of the ridge. By encountering some deep cutting across the summit, this elevation might be reduced to about 130 feet. This would increase the lockage 260 feet, and add to the canal 2½ miles. To the expense of these must be added the cost of the engine, and the expense of keeping it in operation.—All of which taken together, would amount to a sum that I should suppose would be altogether inexpedient to expend on the object at the present time.

The other plan is, to drive up a deep cutting from each of the above mentioned points, as far as the ground will permit, and tunnel the remainder.

I think it likely that the distance to be tunnelled might be reduced to about one mile and a half. But even this, with the necessary deep cutting at each end, would be more expensive than I believe the end to be obtained would at this time warrant.

If the portage road is well graduated and constructed, the ascent will be so moderate, and the road so smooth and firm, that on a carriage well adapted, each large horse employed will draw a hogshead of tobacco of the usual weight; and as one half the road will be descending, and the back loads small, the heavy draught will only be on one-fourth of the distance travelled.

Under these circumstances, with the best conveniences for loading and unloading, a team will make four loads a day in long days, which will be equal to 22 miles travelling: and three loads may be made when the days are shortest. On this calculation, four stout horses would transport 4,000 hogsheads in one year. The expense of such a team and driver in that country, would not be $ 1000: so that without allowing any thing for back loads, the expense of transportation on the portage may be reduced to 25 cents per hogshead, and other articles in proportion.

In endeavoring to ascertain the most eligible route for this connection, the upper branches of Ward's Fork were examined. It was found that a tolerable supply of water might be obtained on the principal branch, at a point not more than one mile and a half from the Buffaloe creek, at McCune's spring; but it was believed that the Buffaloe at that place was too small to afford a sufficient supply for a canal in the other direction. It was also ascertained that the ground on Ward's Fork was less favorable for the purpose of canalling than on the Little Roanoke.

The distance on the margin of the river from the mouth of Buffaloe to Farmville is 276 perches, and the fall of f. 5 in. 11 3-8. The canal navigation may be connected with the navigation below Farmville, by the same plan that may be adopted for the improvement of the Appomattox river.

THE LITTLE KANAWHA.

Very soon after my return from the Appomattox river, agreeably to previous arrangement with Col. Hayman, who resides at the Bull Town Salt Works, three miles below the falls, I addressed him a letter, stating my prospects of being at that place, about the first week in the eighth month, and requesting him to prepare a suitable boat and boatmen for the purpose of descending the river. But when I arrived there, owing to improper conduct in individuals attached to the Post Office establishment, my letter had not been received; and of course, no preparation was made.—An old and very unsuitable canoe for the purpose was however procured, and two boatmen engaged. On the 10th. in company with John Hayman, the examination was commenced.

From the falls to the Salt Works, the river is mostly rapid or a gravelly bed, and but little prospect of its being used for navigable purposes.

From the Salt Works to the Beaver Dam, about four or five miles, the only obstruction to navigation, when there is a sufficiency of water, is the fallen trees; which, in some instances, almost close the passage. At the Beaver Dam, there is a short bend that may be improved by a small projection from the left shore, so as to direct the current more toward the point of a gravel bank on the right: this would make the bend more gradual. Thence down to Howell's old mill dam, there are a number of small gravel ripples, which may be improved, by swelling the water and forming a few sluices. At a place called the Buffaloe shoals, in this section, a wing should be projected from the mouth of a run on the right shore, and a little below where the left begins to be convex, another from the left side. The fallen and drifted timber still form some obstructions; but, as the river gets wider, the inconvenience from them diminishes. I think from the beginning to this place, which is about thirty miles, $ 30 per mile will be sufficient to remove the trees and the few detached rocks or large stones, which appear in a few places; and also to erect the wings, jetties and sluices that may be necessary.

Howell's old dam forms some obstruction, that may be easily removed. Then to Steer creek, supposed to be 18 miles, there are but few impediments to encounter except the gravel ripples. On several of these, the water spreads to a great width in proportion to the quantity, and of course, is very shallow. On some, the fall is greater than higher up the river; and in a few places, it may probably amount to two feet in 150 yards. The only improvements that can with propriety be adopted, are, deepening on the ripples by means of jetties and wings, and in some places, confining the water in sluices properly located. The most important of these improvements may be effected for about $ 20 per mile; but, it would probably cost double that sum to render the navigation as perfect as the river will admit. In the next twenty-five miles to Depugh's, there are many small shoals; the bed of the river more rocky than above, and the course extremely crooked; but, there are no abrupt falls. There are, however, a few rapid ripples, on which the fall may be about two feet in one hundred yards. These, in their present state, would be laborious to ascend by keel boats or batteaux. The improvements must be effected by the same means as beforementioned, with some additional labor in removing detached rocks and stones from the boat passage. $ 40 per mile, will probably effect all that may be necessary for a downward passage, and render the navigation tolerably good for ascending boats.

From Depugh's to the mouth of the West Fork, about 14 miles, the river continues very crooked, with a rocky bottom, but moderate fall; the shoals less frequent, but more expensive to improve. About a quarter of a mile below the fork, occurs, what are called the West Fork Shoals; but has more the character of a rocky fall than any above it. I suppose the fall may be four feet in 300 yards; breaking through a ledge of rock at the upper end; where a mill is building, and a dam to be immediately erected. A graduated sluice will be necessary below the dam near the left shore, which may probably cost $ 200. But I am of opinion, that $ 50 per mile for the last fourteen miles, including this fall, will be a sufficient allowance for the improvement of this section, except for the obstruction that will be presented by the dam itself. For permission to erect this, I was told a special law had been passed. It was stated to me, that permission had been obtained to erect a dam, 4 feet higher than a certain rock, that was pointed out, which was then two feet or upwards above the surface of the water, making the top of the dam at least 6 feet above common low water. If such a dam should be constructed without a suitable slope, it will prove an effectual bar to all navigation from above, except in high freshets, and also to the ascent of fish in common water, or even in moderate freshets.

From the West Fork Shoals to the Burning Spring Ripple, (say 11 miles,) there are but few shoals, and those inconsiderable. I think it likely that $ 30 pr. mile will make the necessary improvements. At the Burning Spring Ripple (as it is called) there is a rocky fall of about 3½ feet in 100 yards, and most of it in one third of that distance. There was formerly a mill at this place. It is by far the best mill seat I have seen on the river. If a mill was again erected, the dam and slope would overcome the most of the fall. Through the remainder there should be a graduated sluice. If it is improved without a dam, an opening must be made of sufficient width through the shelly rock near the middle, and a graduated sluice through the remainder. This might probably cost $ 200. From the Burning Spring Ripple to Beechem's mill, about 12 miles, there are several shoals; two or three are long and will require wings and jetties, but as the shoals are not numerous, $ 40 per mile will be amply sufficient for the improvement of this section. At this place there is a small village called Elizabeth. Beechem's mill dam forms a complete obstacle to navigation and the ascent of fish, except in high freshets. It appears that it would require a rise of at least 6 feet to carry over a flat bottomed boat or loaded batteau with safety, as it has neither lock nor slope. The situation for a mill is excellent, if the dam was kept in repair; and if furnished with a lock and slope, it might even be raised a foot higher without injury to the navigation, or materially preventing the ascent of fish.

From Beechem's to Coe's old mill, 7 miles, there are but two shoals, and at these the fall is but small. I should suppose $ 200 ought to improve this section.

At the last mentioned place the navigation is entirely stopped by a dam, without lock or slope. The mill has recently been burnt down, and will probably be re-built. In that case, the navigation may be improved as stated for the mill next above. If the mill is not re-built, the expense at that place may probably be $ 100.

From this place to Creel's mill, 12 miles, there are but two shoals; the first is called Jackson's Ripple, and the other the Slate Ripple. The fall at each appears to be about 4½ feet.—Jackson's is about a ¼ of a mile long; the other some shorter (say 300 yards;) the river at each place about 120 yards wide.

Wings and graduated sluices will be necessary. The two may probably cost $ 300. At Creel's mill dam, a lock and slope must be made; or perhaps, as the dam is low, a slope might be constructed so as to admit of boats being drawn up by a windlass or capstan.

Between Creel's mill and the mouth of the river, 8 miles, there are three ripples. The first is short, but has a fall of about 3 feet, and will require a wing and graduated sluice of 200 yards. This will probably cost $ 150. The next is longer, with less fall; but as there are some rocks to remove, may cost $ 200. The third is very small; $ 50, will probably be adequate to the necessary improvements.

The whole amount of the improvements proposed is $ 5,330. The length of the river from the falls to the mouth, in part by estimation, from place to place, and in part by actual measurement, is about 140 miles. On a direct line between the extreme points, it is probably not more than half that distance; but in a considerable part of its length it is extremely crooked, even for a river in a mountainous country. For eight or ten miles below the falls, it may average about 40 yards in width, but gradually widens to 150 yards, for some miles above its mouth. In places it is spread to 170 yards. The fall for the whole distance may be considered very small for the bed of a river surrounded by mountains.

From the foregoing description, it will be seen that not a single rugged or impassable fall any where exists in the whole distance. If the mill dams were removed, it would not in its present state (from a few miles below the salt works to its mouth,) whenever there was a sufficiency of water, present a more difficult navigation either for descending or ascending boats, than the James river, in its present improved state.—But, as the rivers generally west of the Alleghany mountains are more affected by the inequality of the seasons, than on the east, so this river largely partakes of that character. For, notwithstanding it drains a large district of country, and in the winter and spring months, assumes the appearance of a considerable river (particularly in its lower sections,) yet in low summer water, on the broad shoals, there is not sufficient depth to float a canoe. In this situation I found it, which rendered our descent very tedious, and extremely fatiguing to the boatmen, even to drag the empty canoe so frequently as we found it necessary.

It will be seen then, that a large proportion of the estimated expense is not for the purpose of procuring a safe navigation, as less than one half would effect that purpose; but in order to obtain an useful navigation on the smallest possible, and moderate rise of water, when there would be none without such an expenditure. But, after all has been done that can be expected in the bed of the river, still we must calculate on a deficiency of water for all navigable purposes, several months in the year.

For the principles to govern the execution of the works proposed for this river, I refer to former reports on subjects of the same nature: And without some attention to these principles, the sluices in the upper sections will fill with gravel, and in the lower, with sand. Wherever slopes are proposed, they are understood to be such as are recommended for the upper part of the navigation on the west fork of the Monongahela river.

After finishing the examination of the Little Kanawha, agreeably to my instructions, I visited the Great Kanawha, and in company with John Bosher and Philip R. Thompson re-examined all the material falls below the salt works, finally determined the mode of improvement at each, and defined the ground where the operations are to be performed.

I also viewed the boats, and machinery constructed and in progress, which are intended to be used in effecting those improvements. The boats appeared to be well adapted, and I think the machinery which is of John Bosher's own invention, so far as it was executed, looked promising. Considering the disadvantages under which he had carried on the work, he had certainly performed much for the time and the number of hands employed.

From the Great Kanawha I rode to Lewisburg to meet the road commissioners; and finding they were on the eastern end of the line, I went out to meet them. I found them at the White Sulphur Springs; where we had a conference on the subject of the road, from which I found that the whole line had been retraced, plainly marked, and the brush in part removed, so as to admit its being fairly viewed preparatory to contracting for the execution. Those parts of the line suggested in my report as being capable of some improvement had been re-examined, and the improvements adopted; by which some shortening had been effected.

The next object to which my attention was directed, was the examination of the

CLINCH RIVER.

The members of the legislature from Russel county, having last winter recommended Col. H. Smith as a suitable person to assist in making the necessary previous arrangements for the examination of the Clinch river, I took the earliest opportunity after arriving on the western waters to write him on the subject by mail. But on my arrival at his house several weeks after the time he ought to have received my letter, I found it had not come to hand; and therefore, no preparation was made. His residence is six miles from the place of beginning. The procuring a suitable canoe for the purpose, the necessary assistants, &c. caused a delay of several days. But on the 7th of the 9th month, having John Hurt, Absolum Hurt and Thomas Robins as assistants, I commenced the examination at the junction of the Clinch and the Maiden Spring Fork.

From the place of beginning to Henry Fuller's, 8 miles, there is no material fall at any one place; there are, however, a number of small ripples which might be improved at a small expense. But a short distance below, the river becomes very rough with great fall, and would be very expensive to improve for 9 or 10 miles, so as to make it tolerably safe for the descent of flat-bottomed boats. The succeeding 4 or 5 miles to Squire Nash's mill are still much more rugged; nothing short of several expensive locks and a large expenditure in the bed of the river could render this section a safe navigation. I am therefore of the opinion, that there is at present no prospect of a trade that will warrant the attempt to improve the section of this river lying between the mouth of the Maiden Spring Fork and Squire Nash's mill. This distance is by estimation 22 miles.

From Nash's mill to James Wheeler's, about 25 miles, there are no material obstructions, but a great number of gravel shoals and rocky ripples. Then to David Osburn's, 4 miles, nearly the same, except two abrupt falls. The first which is nearly two feet, may be improved by making an opening through the rock near the left shore, and constructing a sluice below, so as to confine the water for some distance. This will render the descent perfectly safe, and the ascent comparatively easy. The expense may be $ 150.

The second is a fall of about 2 feet 9 inches nearly perpendicular. Here there ought to be an excavation made through the ledge near the right shore, and sluiced as before described. This will probably cost $ 300. With the addition of these two extra sums, I am of the opinion, that about $ 40 pr. mile, will remove the detached rocks and level down the worst of those that are fixed in the boat passage, so as to render the navigation quite safe from Nash's mill to this place, on a freshet of 3 feet above the present water, which is said to be below the summer average. But it will probably require an additional sum of $ 50 pr. mile to improve all the shoals, so as to give a sufficient depth at those places with a freshet of 2 to 2½ feet. The freshets here mentioned allude to the average rise of water, and not to a measurement on the ripples in their present unimproved state; where in consequence of increased rapidity the rise of water would not probably be more than one half the common average.

From Osborne's to Hosea Alley's dam and mills, about 15 miles, the river is mostly rough; particularly for some distance above and below the mouth of Guess's river. Here the Clinch passes through the Stone mountain, known further eastward by the name of the House and Barn mountain, and some distance west, it is called the Big Black. Through this gap the river is very rapid; and in places, the falls are abrupt, though not great. It may, in fact, be considered one entire rapid from Rock Shoals, 2 miles below Osborne's, for 10 or 12 miles; and will require the removal of many large rocks to render it a tolerably safe navigation. I think from Osborne's to Alley's mills, it will cost at least $ 1500 to effectuate this purpose; and to improve the shoals to the greatest advantage, about as much more.

From Alley's mills to Sally's, 17 miles, there is nothing to prevent boats passing down in a freshet; but, it would require considerable expense to improve the shoals, so as to make the best of moderate water; say $ 40 per mile.

From Sally's to the Tennessee line, 22 miles, the obstructions to a safe navigation are very trifling; I think they might be removed for about $ 300. But, it would probably cost

$ 40 per mile in addition, to improve the shoals in the best style.

The whole distance examined from the Maiden Spring Fork to the Tennessee line, is, by estimation of the inhabitants, from place to place, 105 miles. From Nash's mill to the line, 83 miles. The whole amount of the expense estimated for the improvement of these 83 miles, so as to admit the descent of flat-bottomed boats with the least possible quantity of water, is $ 7,920. But, as the products to be transported on this river, will, probably, for many years to come, be principally carried in flat-bottomed boats, which do not return; a comparatively small number of which would, for some time, be sufficient to carry all the surplus products of the adjacent country: and, as there might be some difficulty in raising even three fifths of the sum just mentioned, I should suppose, that the better plan would be, in the first instance, to render the navigation perfectly safe on a freshet of three feet or upwards; several of which annually occur. This, I believe, may be done for about $ 3,500.

Whenever the remainder of the estimate is to be expended, for the purpose of procuring a greater depth of water in shallow places, in a smaller freshet; this effect must be produced by the same means that are recommended for the Little Kanawha, and other rivers abounding with shoals.

If the trade on this river was to be carried on entirely in keel boats and batteaux, and the water on the shoals collected in narrow sluices, there would, probably, be a constant navigation 8 or 9 months in the year. But, as the flat-bottomed boats require the sluices to be much wider and deeper; so long as they continue in use, it will require some rise, even on common winter water to float them every where with safety, after all the improvements are completed, that can be made in the bed of the river.

There is a fall a few miles below the Tennessee line, in the passing of which the boatmen apprehend greater danger than from any above it, quite up to Nash's mills. It is called Rodger's shoal. In going to Powell's river, I rode several miles out of my way to see it. The danger is produced from several high rocks being so situated in very rapid water, that it is extremely difficult to steer a heavy boat with safety over the fall, until the water is so high as to float it over one or more of these rocks. I am of opinion that a judicious expenditure of $ 330 would make this fall perfectly safe, and admit the passage of boats with 1½ to 2 feet less water than at present.

POWELL'S RIVER.

This is a small narrow river; and as it is contemplated to navigate it with flat-bottomed boats, it will not admit of much contraction on the shoals.

The examination was commenced at Joseph Hagar's mill dam; from whence to the road from Lee court-house to Black Water Salt Works, about 16 miles, there is but little fall; but, in places, there are some detached rocks that require removing; and also a few fixed rocks which rise above water, that ought to be levelled down: there are also some trees and bushes to be removed in places on the shore, to give room for the steering of boats in freshets. As all these obstacles may be very easily removed, I am of opinion that $ 500 will be sufficient for the improvement of this section.

From the crossing of the road above mentioned to the Tennessee line, about 24 miles, there are still fewer obstructions. I think the expense of improving this section ought not to exceed $ 400.

It would, perhaps, be practicable to improve this river for a batteau navigation only, so as to render it constantly navigable during the winter and spring months; but as it is probable that flat-bottomed boats will be principally, if not altogether used, it is too narrow to admit of any other improvement, than merely to remove such obstacles as are found in the line where the boats must pass.

In order to do this, a skilful person should superintend the work, who will be competent to judge, in *low water*, where boats can be steered, with least difficulty and danger, in *high water*; and take his measures accordingly.

The work ought to be done in very low water, and every thing that then appears above the surface, in the boat passage, ought to be removed, or levelled down even with it.

There are very few, if any, of the fixed rock that will require a single blast. They are small, and will generally easily yield to the crow-bar and the sledge. The whole length proposed to be improved, is about 40 miles; mostly in a very fertile valley.

Few rivers of the same length, in a mountainous country, can be placed in the best state of improvement that the quantity of water afforded will permit, with so little expense.

It is said there are two or three rocks below the Tennessee line which present much greater difficulty to the passage of boats than any above. The cost of removing these, it is believed, would be trifling.

Accompanying this report, are a map and profiles of the Appomattox, and the connection between that and the Staunton rivers; with the field notes of the survey and levelling of the same; also my field notes of description, with remarks relative to all the objects on which I have been engaged the present year.

All which are very respectfully submitted, by

THO'S. MOORE, ***P. Engineer.***

POSTSCRIPT.—I expected to have been called in, in the course of the season to attend the joint commissioners of Virginia and Maryland, on an examination of the Potowmac river, and probably some of its branches. Had this have taken place, it would have given me an opportunity of executing the orders of the board with regard to several branches of this river, without incurring the expense, and consuming the time that must necessarily have taken place by a journey for the special purpose. It was also my intention to have passed from the head waters of the Potowmac across the Alleghany to Tygert's Valley branch of the Monongahela, and made the necessary examination of that river. But as those commissioners did not require my attention, I went on to execute the surveys and examinations stated in the foregoing report. After my return from the south-western part of the state, in the 10th month, it was too late to give the necessary attention to all these objects, and have my report in readiness in due time. Some of them might, however, and would have been attended to, had it not have been that the extreme sickliness of this part of the country, at that time, rendered the attempt, as I thought, very hazardous.

It was then my intention to have prepared my report, and left home early enough in the last month to have reviewed the Rappahannock on my way to Richmond; but the severe indisposition of many of my near relations, and some important business in relation to my private concerns, prevented this plan from being carried into effect. But I hope, and believe no inconvenience will result from the delay. I consid[illegible] it [illegible]ue to the board and to myself, to put the former in p[illegible]n of the foregoing exposition.

T. MOORE.

(C.)

TO THE

BOARD OF PUBLIC WORKS,

FOR THE

STATE OF VIRGINIA.

I had intended, immediately after my arrival here in the latter part of the 11th month last, to have proceeded to the examination of the Chickahominy river; but was prevented by a fall of snow the night after my arrival. The melting of this, and the unusual quantity of rain for two or three weeks afterwards, raised the river, and continued it in an unfavorable state for the purpose, until the 25th of last month; and even then it was too high to be viewed with the greatest advantage; but on that day I commenced at the Meadow Bridges, and progressed downwards.

Between the Fredericksburg road and the tide water, there are seven roads which cross this stream on bridges. At some of the crossing places, it is divided into several channels, requiring a bridge for each. They are known by the names of the Meadow Bridges—New Turnpike ditto—New Bridges—.

Bottom's Bridges—Long Bridges—Jones' Bridge and Soane's Bridge. The first mentioned is considered to be at the highest point of practicable navigation, and the last, at the head of tide water. The distance between them is supposed to be, by water, 40 miles.

The valley in which this section of the river lies, will probably average one mile in width; at least half of which is occasionally covered with water; and at all times in the winter and spring, too swampy to traverse on horseback, or on foot. My observations were, therefore, principally confined to the crossing places; towards the lower end, however, the river was approached at many other points.

By observations made at and near the accessible parts, and by information derived from those well acquainted with the river, and the adjacent grounds, in the intermediate spaces, I think I have made myself fully acquainted with its general character, and the means which ought to be adopted in order to render it subservient to the purposes of navigation.

The soil of the valley through which it passes, is all alluvial; not a single rock or stone larger than small gravel is to be found in the whole distance. The declivity is gradual and uniform throughout. The grounds which are too wet for cultivation, are every where covered with trees. The continual decay, and consequent falling of these into the bed of the stream, and also those that are frequently blown down in their green state, and many which have been cut down by hunters and others, have obstructed the channel, more or less, in hundreds of places. In some instances, banks of sand and mud have so accumulated about the fallen timber, as almost entirely to close the passage, causing the water to form deep ponds above the obstructions, and when a little raised, to spread over a great extent of low ground before it can pass off. Several small channels are in places excavated, thro' which a part of the water passes, and occasionally the whole, leaving the original bed to fill up, and in time to be covered with trees. In fact the causes mentioned are operating a perpetual change in the bed of the river, and in places so effectually closing up the channel, that it is difficult to point out where it originally existed, or where any principal one can now be found.

From the Holly landing, one mile below Soane's bridge, the navigation is at all times good for large boats; and from the Windsor Shades, four miles below, for sloops and schooners.

To improve this river to the best advantage for navigable purposes, it ought to be commenced at the lower end. Where the length of the first section is determined, the course of the river and the adjacent grounds should be carefully examined; and where the river is very crooked, a line of canal ought to be so laid out as to straighten the course as much as the ground will permit without running into deep cutting; but adhering to the natural bed, where the course is nearly direct.

When the line for the section is concluded on and marked out, the timber should be removed from the sides to such a distance as effectually to guard against future injury to the canal, or natural channel by the falling of any of the remaining trees. The opening of the canal may then be commenced at the lower end. The dimensions near the tide water may be about 28 feet in the bottom and the banks properly sloped; the depth may probably average about 2½ feet. The earth which is removed should be deposited on the sides to the best advantage to confine the water in freshets. Such parts of the present channel as are intended to form a part of the line must be improved by removing obstructions where necessary.—The water may then be turned through the new excavations and used for the purposes of navigation. The same operations may be continued from section to section to the highest point mentioned, except that the width of the canal may be gradually diminished as the stream is ascended; 18 feet in the bottom would probably be sufficient at the head of the line.

I think it likely that the improved navigation would be shorter by several miles than the present bed of the river, and that rather more than half the distance would be artificial canal; say 20 miles of this, and 16 of the natural bed improved. The former would average 12,224 cubic yards of cutting per mile. The very great number of roots running in every direction through the earth would render the work difficult and tedious: I should estimate the cost at about 25 cents per yard.

12,224 cubic yds. at 25 cents, is $ 3,056 00	
Which multiplied by 20 gives	$ 61,120 00
Improving the natural bed where it is used, may cost $ 500 per mile, which will be	8,000 00
Making in the whole	$ 69,120 00

Supposing that each individual owner of land on the line would incline to cut his own timber, there is nothing allowed for clearing the trace.

Judging from what I have seen of this river and from the best information I can collect, I think it may be stated, that such an improvement as has been described, would give in usual seasons a tolerably good batteaux navigation seven months in the year.

But whether the benefits that may be derived from the navigation, will be an adequate compensation for the expense incurred in improving it, is a question that at present would be difficult for me to decide. I am however prepared to give an opinion relative to another question connected with the subject; that is, what will be the effect of the work when completed, in relation to the draining and rendering arable the extensive swamp through which the river flows? I believe that with the aid of lateral drains, it will reclaim about 20 square miles, or 12,800 acres of land of an excellent quality; laying it dry enough for corn or grass.

The present state of this extensive tract, renders the country sickly for some distance on each side. But there is cause to believe, that when it shall be cleared of timber, laid dry, by the plan proposed, and exposed to the influence of the sun and air, that the diseases which at times prevail in its neighborhood, will disappear.

The timber above the long bridges is principally ash, gum, white oak, willow oak, and Spanish or pin oak; and below, the same kinds, mixed with a great deal of cypress. The ash and the oaks are excellent in the lower sections. If a larger proportion of this timber should in the first instance be transported to market, by way of this navigation, and afterwards the products of the soil, when put in a good state of cultivation, it may at least be considered an important one to the holders of land through which it passes, or of the adjacent lands on either side.

Respectfully submitted, by

THO'S MOORE, *P. Engineer.*

Richmond, 1*st mo.* 20*th,* 1821.

(D.)

Extract from the journal of the Board of Public Works, of the 22d day of June, 1821, when the following resolutions were adopted.

Resolved, That a collector for the president and directors of the Board of Public Works, be appointed by ballot, to hold his office, during the pleasure of the president and directors of the Board of Public Works.

Resolved, That such collector be authorised and required, to collect, without delay, all monies due, or to become due, to the president and directors of the Board of Public Works, and pay the same into the treasury forthwith, after collection, and without deduction, to the credit of the fund for internal improvement, and render an account of such payments to the secretary of the board.

Resolved, That such collector do, before he enters upon the performance of the duties of his office, enter into bond with ample security, to be approved of by the president and directors of the Board of Public Works, if in session, or if not in session, then by the members of the board ex-officio, or of a majority of them, to the president and directors of the Board of Public Works, in the penalty of $ 50,000, with condition for the due and faithful performance of all his duties, as the collector of the Board of Public Works, and especially, for the faithful payment of all monies which shall come to his hands, by virtue of his office; and, upon such bond being given, the secretary of the Board shall deliver, to such collector, a certificate of his appointment, and a copy of the foregoing resolution, under the common seal.

Resolved, That the said collector be paid as a compensation for his services, until the Board shall take further order therein, semi-annually, the sum of two hundred and fifty dollars, and that warrants do issue therefor accordingly; and that he be allowed any reasonable expences, which he may actually incur, in the collection of monies, due to the Board of Public Works.

Resolved, That the collector of the Board of Public Works, be required to render his accounts of all monies, collected by him, at least once in three months.

(A true copy.)

BERNARD PEYTON,
Sec'y. B. P. Works.

(E.)

Extract from the journal of the Board of Public Works, of the 25th June, 1821, when the following resolution was adopted.

Resolved, That so soon as the surplus income of the James river company, of the last year, or any part thereof, shall be paid into the treasury, to the credit of the fund for internal improvement, the collector of the Board of Public Works, be authorised to contract for the purchase at, or under par, of the certificates of the James river loan, to the amount of the sum or sums so paid into the treasury; and, upon such contract or contracts being made, and filed with the secretary, that a warrant or warrants for the amount of such contracts, be issued in favor of the said collector, who shall apply the same to the satisfaction of such contracts, and deliver the certificates of loan so purchased, to the secretary, taking a receipt therefor, who shall preserve the same.

(A true copy.)

BERNARD PEYTON,
Sec'y. B. P. Works.

PRINCE EDWARD, November 30, 1821.

To BERNARD PEYTON, Esq. Secretary
of the Board of Public Works of Virginia.

SIR,

The managers for the Appomattox company, in forming their annual report, beg leave to state to the Board of Public Works, that during the last year they have incurred no expense, except what was requisite to keep their works in repair. Their funds have been still applied to the payment of their debts.

The tolls received by the company during the last year, amount to the sum of	$ 3,187 34
Rents,	2,000 00
	$ 5,187 34

The enclosed paper, marked A, gives you a view of the articles on which tolls have been paid for the last year. We are pleased to see, that notwithstanding the difficulties which have attended commerce, the annual rise of the amount of tolls demonstrates the increasing facility afforded by the navigation of the river.

The Appomattox company have not created the 150 shares of stock, proposed by the act passed the 3d of March, 1821. They do not think it proper to enlarge their stock, unless the shares should be taken agreeable to the general rule fixed by the 12th section of the law creating a fund for internal improvement, passed the 5th of February, 1816.

We have heretofore judged it expedient to pay debts due private creditors, leaving the debt due to the bank and the commonwealth, to the last.

The amount of the company's debts up to the 1st of September, 1821, including interest, is		$ 17,361 24
Amount of debts due the company, with interest to the same date,	$ 9,716 87	
Cash on hand,	1,543 66	
		11,260 53
Balance against the company,		$ 6,100 71

Should it be judged by the Board of Public Works inexpedient for the commonwealth to subscribe for 150 shares on the terms on which shares are taken in other companies, we hope they will recommend to the Assembly, that we shall have further indulgence for the debt we owe the commonwealth. The auditor wishes to have his duty pointed out in this respect.

Your obedient servants,

WILLIAM S. ARCHER,
RICHARD N. VENABLE, } *Managers.*
THOMAS A. MORTON,

(A.)

Upper Appomattox Company's statement of Tolls, from 1st September, 1820, to 1st September, 1821.

Months.	Flour.	Wheat.	Tobacco.	Corn.	Salt.	Up Load.	Coal.	Shells.	Dols. Cts.
September, 1820,	69	666	23	-	24	1500	1	-	34 04
October, 1820,	780	3022	176	-	314	49800	27	11	268 95
November, 1820,	801	2219	43	-	162	20330	47	6	207 04
December, 1820,	2238	2821	49	-	264	38300	29	-	353 34
January, 1821,	1440	2412	100	474	-	42700	15	2	276 98
February, 1821,	1518	3252	296	729	56	68350	34	30	421 46
March, 1821,	663	3783	394	490	12	58550	26	52	374 15
April, 1821,	908	1778	533	-	973	41650	23	98	408 81
May, 1821,	555	1344	652	238	388	54450	20	29	371 03
June, 1821,	239	787	243	-	382	36100	26	-	190 87
July, 1821,	21	1387	190	-	516	31850	24	4	153 87
August, 1821,	175	2207	73	-	320	12100	12	21	117 80
TOTAL.	9407	25678	2672	1931	3411	455680	284	253	$ 3178 34

NORFOLK, 10th December, 1821.

To the President and Directors
of the Board of Public Works.

Gentlemen,

We now present the Board of Public Works, with the state of the Dismal Swamp Canal company at this time.

Referring to the last report made by the company, we proceed to state what have been our operations from the date of that report.

The digging of the Canal upon the enlarged plan, having been completed prior to our last report, our attention has been directed to the erection of stone locks, with other improvements of minor consequence. We have the satisfaction to state, that the upper chamber of the stone lock at Deep Creek will be completed in eight or ten days: this important object was delayed in consequence of the doubt which existed as to the loan which was sanctioned by the Board of Public Works in June; while doubt existed, contracts could not with prudence be entered into. Of the loan mentioned, $ 12,500 have been received, and fourteen thousand dollars have been authorised by loans from the office of discount and deposit of the bank of the United States at this place, which leave $ 23,500, for the operations of the year ensuing.

The expenditures on the canal during the last year, including the upper chamber of the stone lock at Deep Creek, the raising the banks, improving the roads, with repairs of the present wood locks, and contingent expences, with interest on money borrowed, has amounted to about $ 33,000; to meet which,

Received in July last from the Board of Public Works,	$ 12,500 00
Tolls received from December, 1820, to December, 1821,	6,286 46
Anticipated loan, as above stated,	14,000 00
	$ 32,786 46

The whole debt due by the company, at this time, amounts to $ 131,215 73; in which is not estimated $ 37,500, to be received from the Board of Public Works, in completion of the loan of $ 50,000. It will consequently result, that when this sum of $ 37,500 is received, and the loan of $ 14,000, anticipated, is discharged, the amount of debt will be increased to the sum of $ 154,715 73.

Our resources for the year ensuing, will be the tolls to be received, and $ 23,500 unexpended of the loan of $ 50,000.

The objects to which our attention will be first directed, are the erection of the stone lock at the south out fall into Joyce's creek; afterwards, to the erection of an intermediate lock near the North West river: also the raising the banks, and carrying the canal to the new locks at each end. It does not appear that the whole of these operations should be completed during the next year, as the wood locks now laid down will answer very well a few years longer. Our attention will be directed to the completion of the canal to connect the North West river with the main canal.

The tolls for the last year have fallen much short of our expectations; which may be ascribed to causes which we feel unwilling to detail at length, but which we cannot pass without notice. It is evident that the commercial restrictions which have been adopted, must have a serious impression upon the income of this canal; and while we lament their existence, and feel their effects, we hope that other views of the subject, being presented to the national councils, may cause their repeal or modification.

JOHN TABB, JOHN TUNIS, JOHN COWPER, GEORGE McINTOSH,	*Directors of the Dismal Swamp Canal Company.*

OFFICE OF THE FALLS BRIDGE TURNPIKE
COMPANY, George-town, December 6, 1821.

BERNARD PEYTON, Esq. Secretary
of the Board of Public Works of Virginia.

SIR,

On behalf of the Falls Bridge turnpike company, I have the honor to transmit for the information of the Board of Public Works the following report:

During the last year great progress has been made toward the completion of our road. That it has not been entirely completed, as contemplated in my last report, is to be attributed to the failure of one of our contractors, the uncommon sickliness of the season just passed, and the late period of beginning active operations in the work, occasioned by the want of funds. In June last we effected a negotiation with the branch of the Bank of the United States in Washington, based on the subscription of the Board of Public Works to our stock: under this arrangement $ 6,000 have been received and expended.

The tolls received during the last year, amounting to $ 2 have been absorbed in satisfying the current expences, to which they are necessarily appropriated.

That part of the road now in use, is generally in good condition.

The new work is executed in the most substantial manner, and we have every reason to believe, will be finished in the course of the approaching spring.

Very respectfully,
I am, sir,
Your most obedient servant,

JOHN MASON, Junior,
President of the Falls Bridge Turnpike Company.

OFFICE OF THE POTOWMAC COMPANY,
GEORGE-TOWN, December 5, 1821.

To BERNARD PEYTON, Esq. Secretary
of the Board of Public Works of Virginia.

SIR,

In behalf of the President and Directors of the Potowmac company, and for the information of the Board of Public Works, I have the honor to report:

That the general state of the different works of the company on the river is nearly the same as when the last annual report was returned. Some repairs, but of little cost, have since been made, and principally at the Great Falls where the lock gates had been injured by ice.

A machine has been constructed, to be worked by men, and calculated to pass through the locks for the purpose of clearing the different canals, and is now in use to much advantage. The navigation of the river has been, as of late years, used extensively for the last season during all but the dryest times.

For the year ending on the 1st ot August last, the tolls received amounted to *twelve thousand four hundred and ninety dollars and sixty-one cents.* The enclosed table will exhibit the number of boats, and the amount of tonnage employed, and the kinds and quantities of articles transported, with their estimated value.

Except so much as was necessary for the current expences of the year, and for the necessary repairs, and the cost of the mud machine for the canals before mentioned, the receipts for tolls have been applied to payments on the debt due by the company.

With great respect, I am, sir, your very obedient humble servant,

JOHN MASON,
President of the Potowmac company.

STATEMENT

Of the amount of tolls received by the Potowmac company, from the 1st *of August,* 1820, *to the* 1st *of August,* 1821, *together with the number of boats and tonnage employed, and the produce and merchandize transported, with the estimated value of the same, during that period.*

Year.	Boats.	Tonnage.	Flour.	Whiskey.	Tobacco.	Iron.	Other articles of produce estimated.	Sundry return goods estimated.	Amount of tolls received.	Total estimated value.
			Barrels.	Bbls.	Hhds.	Tons.	Dollars.	Dollars.	Dollars.	Dollars.
1821	760	11,400	67,557	1,391	10	115	$ 11,515 00	$ 10,027 00	$ 12,490 61	$ 318,810 00

ALEXANDRIA, 12th mo: 5th, 1821.

To BERNARD PEYTON, Esq.
Secretary of the Board of Public Works of Virginia.

SIR,

Enclosed thou wilt receive the treasurer's statement of receipts and expenditures of the Little River turnpike road company, for the year ending the 31st of the 12th month, 1820, as exhibited to the stockholders at their annual meeting in the 1st month, 1821; in consequence of which, and agreeably to the recommendation of the board of directors, the stockholders, at said meeting, declared a dividend of 6 per cent., payable the first of the 3d month following.

Respectfully, thy friend,

PHINEAS JANNEY,
President of the Little River turnpike road company.

SUMMARY STATEMENT

Of the Treasurer's account, ending on the 31st of December, 1820, examined and passed by the stockholders of the Little River turnpike company, at their annual meeting.

DR.

1821. Jan.—To cash paid James Lewis, superintendent of the upper district, on 18 7-8 miles of the road, for repairs, and to include his salary of $ 500,	$ 3,934 08
Amount carried forward,	$ 3,934 08

Amount brought forward,	$ 3,984	08
To ditto paid Thomas Moss, on lower district, of 5 miles of road, including his salary of $ 500,	4,187	51
To ditto paid salaries of collectors at all the gates,	1,550	00
To ditto paid salary of president, $ 200, and four directors, at $ 100 each,	600	00
To ditto paid their expences on the road,	27	00
To treasurer's commission, on $ 23,534 14 at 2 per cent.	470	68
To cash paid printing tickets for gates, and advertising the meeting of the stockholders, and time of payment of dividends,	50	25
To marshal's and sheriff's fees, and expenses of stockholders at their annual meeting,	116	62
To cash paid Mrs. Tucker, amount of her deceased husband's three shares, forfeited by order of the stockholders,	60	00
To expenses for fees, &c. in suit of Peter and Nathaniel Skinner,	11	48
To G. Scott, claim for stone taken for the use of the road,	21	60
To half the expense of repairing the bridge at Little river,	31	50
For reducing two hills, and erecting a stone bridge between the 13th and 14th mile stones,	1,100	00
To cash for purchase ¾ share Little river turnpike stock, at $ 92, and 2¾ ditto at $ 91 50,	320	62
Paid dividends for the years 1817, '18 and '19,	8,333	91
Balance in the hands of the collector at gate No. 7,	98	85
Balance in the treasurer's hands,	5,646	30
	$ 26,550	40

CR.

1821.		
Jan. 1st—	By balance of cash in the hands of the treasurer, on settlement to December 31st, 1820,	$ 3,016 26
	By amount of tolls received from the first of January, 1820, to 31st December, inclusive,	23,432 41
	By cash for fractional parts of shares, in paying stock dividends,	51 73
		$ 26,550 40
	By balance in the hands of the Treasurer,	$ 5,646 30

JONAH THOMPSON, *Treasurer.*

* * *

CLARKSBURG, November 20, 1821.

To the President and Directors
of the Board of Public Works.

The president and directors of the Monongalia Navigation company submit the following as their annual report: shewing the improvements made by their authority, the proceedings of said company, and their receipts and disbursements, so far as they have been ascertained. At various periods since the incorporation of the said company, they authorised Samuel Clemans and John Patton to erect dams across the river above Clarksburg, on condition of their complying with the
requisitions of the charter in relation to slopes, &c.; [illegible]
the like conditions they permitted John G. Jackson [illegible]
ward Jackson to rai[illegible] previously erec[illegible]
[illegible]he aforesaid point. [illegible] been constr[illegible]
[illegible]aised, but no lock o[illegible]de at either
[illegible]xcept a slope built b[illegible]t his dam b[illegible]

late amendatory act was passed, which being different from those now required, he will have to alter its form and dimensions.

The company purchased of Thomas Reynolds a valuable mill seat near and below the mouth of Jack run, and ten acres of land at the price of $ 100.—They also procured the condemnation of one acre of land on the opposite side of the river, which was valued by the jury at $ 25. These lands have been duly conveyed in fee simple to the company.

At this seat they covenanted with Thomas Chapman, to erect a mill dam nine feet high, with a lock 16 feet wide, and a slope 60 feet wide, with a complete saw mill: the whole at the price of $ 2,600. They also verbally assured him, that they would indemnify him for any approved improvements made upon the premises; under this assurance, he has erected a plain dwelling house, &c. and a cheap grist mill, and under the written contract he has built the mill, dam, slope and saw mill. The lock has not been completed, and the size being deemed unnecessarily large, we design to apply to the legislature to make some alteration in that respect, and until its sense can be ascertained, the lock will not be constructed.

The precise amount of these expenses has not been ascertained, and the delay is in some degree attributable to the omission to have the lock completed, it being desirable that when a settlement takes place with Chapman, it shall embrace all the subjects in relation to his contracts. It is, however, our opinion, that these improvements exceed in value the expense of building the lock.

The company have made some progress towards ascertaining precisely their expenditure at said seat, and regret that they have not completed the investigation so as to communicate it herewith.

The causes above mentioned, with others involving considerations of personal convenience, have prevented the members of the board, to whom that duty was confided, from performing it.

The above embrace all the charges ascertained and paid by the company, except for records, stationery, and contingencies. Soon after the company were informed, that the Board of Public Works had subscribed the shares which they were authorised to take by the law of the 2d of March last, they proceeded to explore the West Fork river, from Clarksburg to its mouth, and selected the proper places for he erection of [illegible]s. They have since appointed a committee to locate [illegible] ams, purchase the sites, &c., but various ses bey [illegible] trol have delayed the completion of this duty. The board, however, expects to prosecute the object of its creation with vigor, in the approaching year, and flatters itself, that the next annual communication will compensate for the leanness of the present one.

Being of opinion that several alterations of the charter are necessary to promote the interests of the company, and are not forbidden by any considerations of policy or justice, the president and directors accompany this report with the outlines of a bill suggesting those alterations, and a brief note of the reasons for asking them, which it is contemplated to lay before the ensuing General Assembly, and which they flatter themselves will receive your sanction.

Signed, on behalf and by order of the said president and directors, by

JOHN G. JACKSON, *President.*

Teste.

JONATHAN JACKSON, *Clerk.*

RICHMOND, 5th Dec. 1821.

To BERNARD PEYTON, Esq.
Secretary of the Board of Public Works.

SIR,

The president and directors of the James River company, respectfully offer the following report to the Board of Public Works.

In compliance with the last act of the legislature, they immediately proceeded to elect and appoint their clerk and treasurer. Mr. Robert Pollard, who had for many years filled the office of clerk, &c., to the company, with great ability and fidelity, was their unanimous choice; and as the duties of his office, and the responsibilities attached to it, were greatly enlarged, it was thought reasonable that his salary should be increased, on his giving such security as the law required, which he has done in a manner most satisfactory to the company, and his salary has therefore been fixed at one thousand dollars per annum.

In relation to the management and faithful application of the funds committed to their charge, the board flatter themselves they will, at all times, be found ready to afford the most satisfactory evidences.

Having duly examined those provisions of the last act of the Assembly which authorise this board to borrow money, and having ascertained that loans could be obtained to the amount authorised, at six per cent., when wanted, this board proceeded, (after finding that the owners of the lands through which the canal should pass, would not yield the lands necessary, but upon valuation thereof,) to have the necessary condemnations effected as speedily as possible, which has been done, finally, (with the exception of one plantation,) as far as the fork of Tuckahoe creek, or to the eastern line of Goochland county.

The delays necessarily arising from formal notices to the parties interested, and from appointments of commissioners, have greatly, to our regret, consumed much time. It was not till June that the condemnations, above referred to, were effected.

It will be seen from the above circumstances, that no great progress could this year be made in the execution of the work committed to the charge of this board, and they are sorry to add, that in consequence of the unusual state of the weather during the last winter and spring, and the sickliness consequent thereon, amongst the hands, during the last autumn, the work undertaken by Messrs. Briggs and Gamble has not been finished, as was expected, and that the building the locks, which is the principal part of the work now to be executed, must be postponed till the spring, although the materials are now in great forwardness; it being deemed imprudent to proceed with such work during the cold weather.

It was found indispensable for the company to have a local engineer, or manager, whose duty it should be, not only to lay off and superintend the execution of the work on James River, but to proceed with such further examinations, condemnations, &c., as might be necessary or preparatory towards further operations, and generally to act as their agent when required; and having great confidence in the zeal and capacity of John G. Gamble to perform these important functions, and in his future improvement and usefulness to the country, they appointed him to that office on the 21st of June, with a salary of $ 2,500 per annum, which they judged to be no more than would be an adequate compensation for the faithful performance of the arduous duties committed to his charge.

Contracts have been entered into with various persons, for the excavation, &c., of the canal to the fork of Tuckahoe, (with the exception of that part of the line within the plantation where a final condemnation has not yet taken place,) on terms fully as low as was estimated by the principal engineer, in his report on this subject, for work of a like kind; which contracts were readily approved by the river commissioners, and the work is now in as rapid a state of execution as, under all circumstances, could be expected.

A breach took place in the canal at the Belvidere arch, in the month of June last; which, in the course of three days was so far repaired, in a temporary manner, as to enable the boats to pass on as before; but, it became indispensably necessary, that this breach should be repaired in the most effectual and permanent manner. The Board determined to do it, so as to enlarge that part of the canal to the width of forty feet, as contemplated in the new plan of improvements, and to make a waste immediately above that place over a solid sheet of rock, that this place might not hereafter be exposed to casualties from sudden floods of water. A large proportion of the expense incurred in the execution of this work, which was done under the personal inspection of the Board, may be considered as properly chargeable to the amount of new improvements.

The revenue which will be derived from the tolls, &c. this year, may, probably, fall short of what has been expected; and, indeed, will, probably, be something less than the average which has been received for some years past. This is to be imputed to the very short crop of wheat made this year, in the district of country bordering on James river.

The company have proceeded towards the improvements of the navigation of the Kanawha river, as far as the difficulty of that work, arising from its novelty, would permit.

It was deemed all important, before expending large sums of money, which might be wasted in fruitless experiments, to ascertain as far as possible, the nature of the work to be done, the best manner of executing it, and especially, the cheapest and most useful machinery which could be introduced in aid of manual labour. For these purposes, the Board selected John Bosher of this place, a man, in whose prudence, talents and integrity, they have the highest confidence, as their manager and superintendent of the improvements on the Kanawha. He was dispatched as early as practicable, with an out-fit of tools, mechanics, &c.; after reporting himself to the commissioners, and consulting with them, as to the work to be done, his first efforts have been directed to the construction of temporary work shops, houses of accommodation for the people to be employed, and the machinery he judged most suitable for his purposes. These preliminary steps have necessarily consumed a good deal of the past season; yet, the Board are enabled to add, from the information they have derived from him, of the experiments which he has made, that they have every reason to believe, they will be enabled to proceed with the work, as early next season, as the weather will permit, not only with considerable dispatch, but, in a permanent and useful manner: and the communications received from the president of the river commissioners, announce the most perfect satisfaction with the superintendent and his conduct; evincing, that the business will be conducted with perfect concord of opinion, and due regard to economy.

Although the opening of the road from the mouth of Dunlap's creek to the falls of the Kanawha is the third object of the law, in regard to the important connection of the eastern and western waters, this board did not consider it necessary that it should await the completion of the other objects, but that all might be going on together; believing that the sooner these important works were consummated, the greater would be the service they should render their country, and the more general would be the satisfaction they should afford. The company, therefore, lost no time in appointing a fit person (as they believe) to make a particular location of the road, with a minute description of the different kinds of work to be executed, embracing, as far as practicable, calculations of the masonry, quantities of earth to be removed, &c.; as well to enable the company to effect condemnations of ground where necessary, as to judge of such proposals as might be made for the execution of the work. This important business was confided toMr. Hugh P. Taylor, who had assisted the principal engineer in his examination of the ground ; and who, aided by the road commissioners, has made a very satisfactory report on the subject.

The road commissioners were requested, after the locations should be made, to procure from the proprietors their consent to the road passing through their land, agreeably to the location ; and in all cases where the proprietors would not yield the land necessary for the purposes of the road, to have condemnations effected as speedily as possible, that the company might be able to ascertain the amount that would be required for that purpose, previous to entering into contracts for the making of the road.

These condemnations have been generally effected, where they became necessary, and amount only to about $ 900, throughout the whole course of the road through Bath and Greenbrier counties ; and it is believed the land will so generally be ceded in the other counties, that the additional condemnations will probably fall short of the above sum. Several persons attended the surveyor, while locating the road, with a view of enabling themselves to put in proposals for the making thereof. The company advertised for proposals for the same, to be received till the first instant. Proposals have been received from two different parties ; with one of whom, it is now believed a contract will be immediately entered into for the whole route. There is, therefore, just ground to believe, that this great work will be speedily commenced, under the most favorable auspices : and as it will be the interest of the contractors to lose no time in the execution thereof, that they may be entitled to draw their ultimate payments, it may fairly be expected that the whole will be finished in a reasonable time.

Copies of all the different contracts which have been entered into, or a schedule thereof, will be laid before the Board of Public Works, if required.

After laying before the Board of Public Works this brief summary of their proceedings, the company think proper to observe, as it may possibly be expected that more than has been accomplished might have been done, since the liberal appropriation of the legislature at the last session, that they found they had a great deal of preliminary work to do, and many arrangements to make, to which they were obliged to devote a great deal of time and attention, as may be seen from a reference to their minute book. The business of the year past is, therefore, more to be considered as preparatory to important operations, than to be regarded for what has actually been done; but when a view is taken of the variety of objects to which the board have been obliged to turn their attention; and when it is seen that all of them have been duly regarded, they flatter themselves they will not be considered as having been wanting in zeal to accomplish the great objects committed to their charge: moreover, the accomplishment of the works going on, on James river, has been considerably retarded by the very severe illness contracted by Col. Gamble, their engineer, during his employment on the river.

In the succeeding year doubtless a great deal may be done in the improvement of the first section of James river, in the improvements on the Kanawha, and also in the making of the turnpike road; and that the public may as soon as possible derive advantage therefrom, the contractors will be instructed to commence their operations at Crists, and proceed westwardly towards the Kanawha, so as that a communication may at once be made from thence with the road running eastwardly from Crists in the present state of improvement.

A particular report of the finances of the company, and all matters touching the same, will be laid before the Board of Public Works in a supplemental report, so soon as the same can be prepared.

JOHN COALTER,

President of the James River canal company.

SUPPLEMENTAL.

The president and directors of the James River company regret that important business of the company, together with their own private matters, have put it out of their power hitherto to make a supplement to the report heretofore made by them to the Board of Public Works.

In regard to their money matters, they have now to report, that in consequence of the provisions of the act requiring certain public officers to examine and settle their accounts twice a year, the last settlement of which was in July last, they have it not in their power to make the next semi-annual statement till after the first of January.

A copy of the result of the last settlement is herewith enclosed, and they suggest the propriety, in future, of closing the year's accounts, as it regards the Board of Public Works, in July instead of January, so that one year's disbursements, &c. may hereafter be before the Board of Public Works at their annual meeting: agreeably to this plan it will be perceived, that for this year, the account will only comprehend the transactions of the six months preceding July last.

The money paid into the treasury to the credit of the Board of Public Works on account of the company, has not been quite as much as would be indicated by their report of last year. This is owing to the circumstance that part of the balance of nett profits appearing on the books consisted of out-standing debts due for rents &c., which have not been collected, and will of course continue to form a part of that balance until collected.

One source of revenue to the company has been curtailed by an agreement which has been entered into by them with John Staples; the rent due from him has hitherto amounted to $ 1,500 per annum, for 250 feet of land, and one hundred and fifty inches of water under a given pressure. This land adjoins a small piece owned by the company, lying between it and that of Peter J. Chevallie, not enough though for a site for a mill; it was proposed by Mr. Staples to re-convey seventy-five feet of land adjoining this, which would make that a good site for a mill, and seventy-five inches, or one half of the water, provided we would reduce the rent, from the first of January last, to seven hundred and fifty dollars per annum, leaving him also the privilege of applying to the legislature for any further relief which it might be proper for them to grant.

The company acceded to this proposition principally on the ground that the number of water works on the canal not only injure the navigation, but when the new improvements are so far completed as to require a considerable use of the lower locks, they may be in danger of wanting water; and believing that if this shall not be the case, they can again sell the same water, either at the site above, or to greater advantage perhaps at the basin, where probably it could be more conveniently spared, and thus remunerate themselves. In the mean time it was thought prudent to possess ourselves of the water.

The receipts of tolls and rents, as has heretofore been suggested, will not be equal to an average for the several years preceding; therefore the nett surplus applicable to the payment of interest on loans (tho' the ordinary expences will not, it is believed, exceed $ 6,000 for the year ending the 31st December, 1821,) will fall short of the last year's surplus.

The company have borrowed no money this year at a greater interest than five and a half per cent.—These loans have been confined to persons residing within this state.

It is understood to be admitted by money holders in other states, that the funds pledged for the payment of the interest on this loan, may be very ample, and their continuance as well guaranteed by the faith of the state, as though the loan was on behalf of the state, and that the final redemption of the debt may be safely calculated upon; but while these things are not expressly guaranteed by the state, but merely susceptible of demonstration from the acts of Assembly, and other public documents, the loan, though a valuable one to those wishing to make permanent investments, is not so readily convertible in market, as to answer their views. It has, however, been pretty satisfactorily ascertained that a state stock, even at five per cent. would sell for more than par, which clearly shews to those wishing to make permanent investments, that the stock now offered to the public at five and a half per cent., must be a most valuable stock.

JOHN COALTER, *President.*

Richmond, December 19, 1821.

Expences of the James River Company, from the 1st of January, to the 30th June, 1821.

OFFICERS' SALARIES.

Hezekiah Mosby, Toll gatherer,		$ 1,000 00	
Robert Pollard, Clerk and Treasurer,		500 00	
William Piggott, Keeper of the upper locks,		287 50	
John Brown, Keeper of the lower locks,		100 00	
		$ 1,887 50	
Charges,	$ 451 24		
Cloathing,	10 47		
Expences for improving the bed of the river,	24 00		
		485 71	
			$ 2,373 21
Dividends due on the 1st of July,			8,400 00
			$ 10,773 21

RECEIPTS.

Amount of tolls,	$ 14,691 95	
Sales of a negro man, $ 1, Received for rents of houses, $ 10,	11 00	
		$ 14,702 95

Summary of the James River Company's accounts, from the 1st of January, to the 30th June, 1821.

DR.

To amount of debts due by the company, beside that of interest on loans,	$ 8,620 34	
To dividends due on the 1st of July,	8,400 00	
To surplus fund on the 1st of January, not paid,	7,057 84	
Balance,	3,891 93	
		$ 27,950 11
To president and directors of the Literary Fund, for 6 months interest,	1,500 00	
Balance,	2,391 93	
		$ 3,891 93

CR.

By amount of debts due to the Company,	$ 3,558 65	
By cash in the Bank of Virginia,	22,956 10	
By cash in the hands of the Treasurer,	1,435 36	
		$ 27,950 11
By balance as per contra,	$ 3,891 93	
		$ 3,891 93

ROBERT POLLARD, *Clerk.*

Probable expences, &c. from the 1st of July, to the 1st of January, 1822.

Officers' salaries including the usual allowance to the president and directors,	$ 2,987 50	
Charges,	296 02	
Amount carried forward,		$ 3,283 52

Amount brought forward,	$3,283 52	
Expences for the improvement of James river, say the bed,	94 00	
Provisions,	4 66	$ 3,382 16
Dividends on the 1st of January,	8,400 00	

INTEREST, (viz.)

To the president and directors of the Literary Fund,	$ 1,500 00		
To Needler Robinson,	85 75		
To John Gray,	91 67		
To Catharine Hays,	58 67		
To Slowey Hays,	58 67		
To Catharine Gamble,	28 12	$ 1,822 88	$ 10,222 88
			$ 13,605 04

OFFICE OF THE SWIFT RUN GAP TURNPIKE COMPANY, FREDERICKSBURG, 3d Dec. 1821.

BERNARD PEYTON, Esq.
Sec'y. B. P. Works.

SIR,

I annex the annual report of the income, expenditure, condition, and progress of this company.

Yours, very respectfully,

WILLIAM ALLEN,
Secretary and Treasurer
Swift Run Gap Turnpike Company.

In obedience to the act of Assembly, the secretary and treasurer of the Swift Run Gap turnpike company make the following report of the income and expenditure of the road for the year ending 1st December, 1821, and of its condition and progress.

INCOME.

Received from stockholders, on account of subscription to stock, .	$ 4,724 04
Ditto Board of Public Works, on account of subscription to stock,	11,500 00
Ditto gate-keepers, for tolls collected,	3,991 01
Ditto the auditor, for negroes attending the court, as witnesses on behalf of the commonwealth,	30 21
Ditto J. L. Marye, for toll-house sold him,	125 00
Total income,	$ 20,370 26

EXPENDITURE.

Paid for labor hire, land, stone, &c.	$ 8,372 47
Do. on account of contract for making the road,	12,744 58
Do. on account of overseer's wages,	562 40
Do. do. gate-keeper's do.	593 58
Do. do. secretary and treasurer do.	164 99
January and July dividends,	3,090 00
	$ 25,528 02

CONDITION AND PROGRESS.

30½ miles complete, beng paved or gravelled ;
1½ do. the stone carried on, but not broken ;
4 do. ditched, thrown up, and culverts made ready to receive the pavement.

WILLIAM ALLEN,
Secretary and Treasurer,
Swift Run Gap turnpike company.

RICHMOND, 4th December, 1821.

To the President and Members of the
BOARD OF PUBLIC WORKS OF VIRGINIA.

The report of the president and directors of the Richmond Dock company respectfully represents, that the attention of the company, during the last year, has been occupied—1st, in the completion of the dam which was commenced the preceding year, for the purpose of throwing an ample supply of water through the canal of Messrs. Philip Haxall and Company, into the dock. The dam is now finished, agreeably to contract, and no doubt can be entertained that the supply of water will, at all times, be sufficient for all the purposes intended; and that the dam is constructed in a manner that promises durability. 2ndly. The labor of the company has been directed to deepening the basin in the vicinity of Mayo's bridge, for the purpose of ensuring such a depth of water as is by law required. Much difficulty and expense attended the execution of this part of the work, the natural bottom being of granite rock, so irregular in its conformation as to render the operation of blasting, by powder, extremely tedious and uncertain: and the quantity of water which continually penetrated through the uneven body of rock, required unceasing labor for its removal. The work is now believed to be perfected, according to the requisitions of the law; and the company feel a confidence that there is no other substance to be found in any part of the bottom of their works, which may not be easily removed by the use of the mud-lifting machines, which have already been so successfully employed. The quantity of rock, which has been blasted in the prosecution of this part of the works, is very considerable, and has been most advantageously applied, in adding to the strength and durability of the outer wall, above and below twenty-third street; and in raising the stone walls on each side of Shockoe creek. 3dly. The temporary lock which was erected on the extended line of 18th street of the city of Richmond, for the accommodation of boats passing through the James river canal, being necessarily placed on a sandy foundation, has, in several instances, given away, under the influence of great floods of water rushing down Shockoe creek, and entering the basin. The repairs have greatly increased the labor and difficulty of the company, for the last year, and have led to the immediate execution of a waste (by contract,) opposite to the entrance of Shockoe creek into the basin. This, it is believed, will give great increased security to the whole works, and will tend very much to relieve the basin and dock from the surface filth, which otherwise might be left floating, to the injury of health and convenience. 4thly. Admonished by the experience acquired in the last mentioned parts of their works, the company have, during the past year, commenced at 23d street, and extended to the lock, a ditch ten feet wide, dug through the sandy part of the bottom, making a depth of from 6 to 8 feet, and caused the same to be well filled with carefully selected clay, to act in the nature of puddle. From this effort, they have already experienced much benefit in the power of retaining water to the given height to which it has yet been practicable to raise it. The results of all the experiments made in stopping and raising the water, in the whole works from the lower lock to Mayo's bridge, has been most favorable to the belief that the southern bank is amply sufficient to retain the water on such elevation as may be required. 5thly. The same precautionary considerations of guarding against the influence of sandy bottoms, have dictated to the company the propriety and necessity of protecting the lower lock from the ravages which either the sudden or gradual removal of a loose bottom might occasion. The measures which the company have adopted, have been very tedious and expensive in their operation; but which, upon every principle of human calculation, promise advantages in every respect equal to the labor and money expended. A set of piles, of large size, have been driven to the depth of eight feet below the bottom of the lock, extending at least one hundred feet in front of the lock, and the same distance in its rear, or lower end. In front of the upper piling, a large body of well selected clay has been placed, to supply the place of the same quantity of loose sand, and vegetable rubbish, taken out of the space; and behind it, partly in the chamber of the lock, and partly in a wharfing, constructed for that purpose, has also been placed a very large body of good clay.

The labours of the company are now engaged in raising the sides of the lock, and in a few days it may be confidently asserted, that the lock will be capable of containing ten feet in depth of water, and the great gates may be safely hung. 6thly. The only part of the work which remains to be finished, for the purpose of carrying the works into immediate operation, by receiving vessels into the dock, and entitling the company to the receipts of tolls, is, an excavation of one hundred feet in width, extending from the lock to Young's wharf, of unequal depth: from the changeable condition of the water which covers this surface, it was found to be impracticable, to employ the steam mud-lifting machine, which had so successfully been used about the lock, and the company were compelled to procure a machine of a smaller size, which has aided to the expences. Considerable progress has been made in this part of the work, and a few months of successful labour may render the passage to the lock, practicable for vessels drawing from 6 to 8 feet of water. The report of the treasurer of the company, which is hereto subjoined, and which is prayed to be made a part of this report, will exhibit a view of the receipts and expences of the last year.

By order of the Board.

JOHN ADAMS, *President.*

RICHMOND, December 3, 1821.

Dr. JOHN ADAMS, President
of the Richmond Dock Company.

SIR,

In compliance with your request, I herewith hand you a statement of the receipts and of the expences, so far as I am informed, of the Richmond Dock Company, for the year ending on the 1st instant.

Respectfully,

H. BAKER, *Treasurer.*

STATEMENT

Of Receipts and Expenses of the Richmond Dock Company, for the year ending on the 1st December, 1821.

By cash received from the Board of Public Works, the corporation of the city of Richmond, and from individual stockholders,		$ 37,356 93
To cash paid in prosecution of the works this year,	$ 15,975 74	
To ditto for debts contracted during the year 1820, and noticed as due in last report,	13,823 81	
		$ 29,799 55
		$ 7,557 38
To amount due on contracts now in progress for negro hire, labor, clothing, support, materials, &c.		10,202 58
Excess of disbursements over receipts,		$ 2,645 20

Shewing the whole amount of disbursements for the year 1821, to amount to $ 26,178 32 c.—the debt remaining due on the transactions of 1820, and now paid, to amount to $ 13,823 81 c.—and the deficit to be provided for, to meet the payments in January next, of the bonds given for negro hire, to amount to $ 2,645 20 c.

E. E.

H. BAKER, Treasurer.

Richmond, December 3, 1821.

LEESBURG, 1st December, 1821.

To BERNARD PEYTON, Esq.
Sec'y. B. P. Works.

SIR,

The president and directors of the Leesburg turnpike road, report; that the whole road from Leesburg to Drane's, a distance of about fourteen miles, is so nearly finished, that it is expected to be received from the contractors by the first of January ensuing; at which time, the proper application will be made for the collection of tolls.

The high water in July last, carried away the bridge over Goose creek—a new one is now building, and is expected to be finished by Christmas.

The stockholders have paid,		$ 36,366 30
Toll received during the last year, for the first five miles,		1,958 60
Toll received at Broad Run bridge,		894 24
Debt due to the Bank of the Valley in Virginia, at Leesburg,	$ 6,700	

On the 1st of January last a dividend was made of the profits of the first five miles, which gave to the stockholders 4 per cent per annum. Owing to the loss of our bridge, it is not probable that any dividend will be made for the last year.

JOHN ROSE,
President Leesburg turnpike road company.

CARTERSVILLE, 12th December, 1821.

To the President and Directors
of the Board of Public Works.

GENTLEMEN,

The Board of managers of the Cartersville bridge company, submit to the Board of Public Works, the subjoined statement of the state and progress of the bridge, the state of their funds and a copy of various resolutions of the Board, which will shew the basis of their contracts for the roofing of the bridge and the making of a road on the south side of the river to the abutments of the bridge, together with the requisitions which they have made, calling upon the stockholders for the balance of the money which will be due on their respective shares. First, with regard to the state and progress of the bridge. The Board will remark, that two of the piers besides the abutments are entirely completed, one more pier is nearly completed, and the remaining two can be finished in three weeks of good weather. One arch is completely finished, and thrown over, the second is now raising, three others are framed, and there is one yet to frame; though all the timber is ready, and dressed therefor.

The work, both masonry and wood, is executed in a masterly manner, as far as the Board can judge. The Board believe that if the winter should prove an ordinary one, the bridge will be passable by the 15th of March; at which time the road will be also ready; and the roof which is contracted for, and most of the timber prepared, will be completed by the 15th of June.

Secondly—The account, marked A, enclosed, of the treasurer, will shew the state of the funds.

Thirdly—The paper, marked B, will exhibit the basis of the contracts made for the roofing of the bridge, and the road thereto, and the requisitions made by the Board on the stockholders to complete the bridge in all its parts, and the road.

All of which is respectfully submitted.

(Signed.)

THOMAS MILLER, *President.*

(Copy.)

JOHN G. DANIEL, *Secretary.*

PART II.

SEVENTH
ANNUAL REPORT
OF THE
PRESIDENT AND DIRECTORS
OF THE
BOARD OF PUBLIC WORKS,
TO THE
LEGISLATURE OF VIRGINIA:

IN PURSUANCE OF AN ACT, ENTITLED, "AN ACT CREATING A FUND FOR INTERNAL IMPROVEMENT."

RICHMOND:
Printed by Thomas Ritchie, printer for the Commonwealth.

1822.

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JOHN G. DANIEL, *Secretary.*

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....
1822.

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OFFICE OF THE BOARD OF PUBLIC WORKS,
RICHMOND, *23rd December*, 1822.

SIR,

I have the honor to lay before the General Assembly, the annual report of the president and directors of the Board of Public Works, prepared in conformity to the act, entitled, "an act creating a fund for internal improvement."

I have the honor to be,
With great respect,
Your obedient servant,

JAMES PLEASANTS, JR.
President of the Board of Public Works.

The honorable the Speaker of the
House of Delegates.

REPORT.

The president and directors of the Board of Public Works, in obedience to the act entitled, " an act to create a fund for internal improvement," beg leave to report to the General Assembly, that the fund for internal improvement consisted, on the 15th day of December, 1822, of the following stocks, viz :

PERMANENT FUNDS.

125½	shares of stock in the Little River turnpike company,	$ 12,550	00
70	shares of stock in the Dismal Swamp canal company,	17,500	00
125	shares of stock in the Appomattox canal company,	12,500	00
70	shares of stock in the Potowmac canal company,	31,111	11 1-9
250	shares of stock in the James River canal company,	50,000	00
7,947	shares of the stock of the Bank of Virginia,	794,700	00
3,334	shares of the stock of the Farmers' Bank of Virginia,	333,400	00
900	shares of the stock of the Bank of the Valley,	90,000	00
231	shares of the stock of the North Western Bank of Virginia,	23,100	00
82	shares of the stock of the Swift Run Gap turnpike company,	4,100	00
	Total amount of permanent funds,	$ 1,368,961	11 1-9

DISPOSABLE FUNDS.

Stocks required by the application of the income of the fund for internal improvement, and disposable according to the 13th section of the act creating that fund, viz :

375 shares of the stock of the Bank of Virginia, - - - -		$ 37,500 00
186 shares of the stock of the Dismal Swamp canal company,		46,500 00
800 shares of the stock of the Roanoke canal company, on account of which was paid prior to the 15th day of December, 1821,	$ 52,000	
And since that time,	6,400	
		$ 58,400 00
35 shares of the stock of the Farmers' Bank of Virginia,		3,500 00
50 shares of the stock of the Bank of the Valley,		5,000 00
34 shares of the stock of the James River canal company,		6,800 00
1,000 shares of the stock of the Richmond dock company, on account of which was paid prior to the 15th day of December, 1821,	50,000	
And since that time,	12,500	
		62,500 00
672 shares of the stock of the Leesburg turnpike company, on account of which was paid prior to the 15th day of December, 1821,	$ 16,800	
Amounts carried forward,	$ 16,800	$ 220,200 00

Amounts brought forward,	$ 16,800	$ 220,200 00
And since that time,	8,400	
		25,200 00
920 shares of the stock of the Swift Run Gap turnpike company, on account of which was paid prior to the 15th day of December, 1821,	$ 23,000	
And since that time,	11,500	
		34,500 00
480 shares of the stock of the Falls Bridge turnpike company, on account of which nothing has yet been paid.		
140 shares of the stock of the Monongalia navigation company, on account of which has been paid,		5,520 00
50 shares of the stock of the Cartersville bridge company,		5,000 00
		$ 290,420 00
Add, loan to the Dismal Swamp canal company, 500 shares of United States bank stock, to be returned in kind, and the dividends in the mean time paid to the Board of Public Works,	$ 50,000.00	
Loan to ditto, upon interest,	37,500 00	
Debt due from the town of Petersburg,	326 00	
		$ 87,826 00
Total amount of disposable funds,		$ 378,246 00

Add, fund for the redemption of the certificates of James River loan, 210 shares of stock of the Bank of the United States, transferred at	$ 23.370 59

Total amount of the fund for Internal Improvement, (viz:)	
Permanent funds,	$ 1,368,961 11 1-9
Disposable funds,	378,246 00
James River fund,	23,370 59
	$ 1,770,577 70 1-9

Upon the productive part of these funds, there has been received, since the 15th day of December, 1821, the following sums, (viz:)

From the Farmers' Bank of Virginia,	$ 10,107 00
From the Bank of Virginia,	45,546 50
From the Swift Run Gap turnpike company,	184 50
From the bank of the United States, of which $ 472 50, is to the credit of the James river fund,	892 50.
From the engineer, an unexpended balance of money advanced for the expenses of surveys, &c.	278 79
From the James river company, for dividends,	9,816 00
From the Dismal Swamp canal company, for interest on loans,	1,125 00
From the Little River turnpike company,	752 87
From the Dismal Swamp canal company, for dividends of stock of the bank of the United States, loaned them,	2,125 00
From the bank of the Valley,	16,194 74
From the North-western bank of Virginia,	3,118 50
Total receipts,	$ 90,141 40
Add, balance in the treasury on the 15th day of December, 1821,	17,206 29
	$ 107,347 69

Out of which have been disbursed, the following sums, viz:		
For the Map, of which $ 5,000 were paid before the last report, which was not then known to the president and directors, these disbursements being made by order of the executive, and not by the board,	$ 9,000	00
Loaned to the Dismal Swamp canal company, by virtue of an act of Assembly,	25,000	00
For the 7th requisition upon the Roanoke canal stock,	6,400	00
For the 3d instalment upon the stock of the Swift Run Gap turnpike company,	11,500	00
For the last instalment upon the stock of the Richmond Dock company,	12,500	00
To Thomas Moore (Engineer) for three quarters' salary,	2,625	00
To Bernard Peyton, secretary, for one year's salary,	750	00
Advanced to Thomas Moore, engineer, on account of contingent expenses of surveys, to be accounted for,	1,000	00
To Anthony Robinson jr., collector, for one year's salary,	500	00
To the Leesburg turnpike company for the third instalment,	8,400	00
To the Cartersville bridge, in full,	2,750	00
To the Monongalia navigation company, a part of which was advanced them improperly,	5,520	00
For pay and mileage of the members,	1,261	45
To the door keeper, and for candles,	49	50
For postage, books, stationary and printing,	149	47
On account of the expenses of surveying the Potowmac river,	1,000	00
	88,405	42
Leaving a balance in the treasury on the day of December, 1822, of	[illegible],942	26

The certain, and probable charges, upon the income of the fund for internal improvement, for the succeeding year, will be,		
The appropriation to the James river fund,	$ 18,000	00
The July, 1822, dividend on 210 shares of the stock of the Bank of the United States, to be carried to the credit of the James river fund,	472	50
Last instalment of the loan to the Dismal Swamp canal company,	12,500	00
Last instalment to the Leesburg turnpike company,	8,400	00
Last instalment to the Swift Run Gap turnpike company,	11,500	00
On account of the map in full,	4,478	29
Further requisition on the Roanoke canal stock, say,	8,000	00
First instalment to the Falls Bridge turnpike company,	8,000	00
First instalment to the Snicker's Gap turnpike company, if the terms of the law of the last session shall be complied with, which is probable,	5,000	00
Expenses of the board, officers' salaries, expences of surveys, &c. &c. &c. say,	7,000	00
	$ 83,350	79

To meet which, the resources of the board will probably be as follows, viz:		
Balance in the treasury,	$ 18,942	26
From the Farmers' Bank of Virginia,	10,107	00
From the Bank of Virginia,	45,545	50
From the Swift Run Gap turnpike company,	184	50
From the representatives of Thomas Moore deceased, former engineer,	158	37
From the town of Petersburg,	326	00
From the James river canal company for dividends,	6,816	00
From the Dismal Swamp canal company for interest on loans,	2,250	00
From the Little River turnpike company,	752	87
Amount carried forward,	$ 85,082	50

Amount brought forward,	$ 85,082 50
From the Dismal Swamp canal company for dividends on United States Bank stock loaned them,	2,125 00
From the Bank of the Valley,	6,600 00
From the North Western Bank of Virginia,	945 00
From the Cartersville bridge company,	300 00
	$ 95,052 50
Probable surplus,	$ 11,701 71

From this review of the state of the fund for internal improvement, (in which the anticipated dividends on stocks are stated at the rates declared during the present year,) it appears, that the Board of Public Works will have ample funds for meeting all their existing engagements; but, that no considerable additional appropriation can be made during the next year. But, during the next year, the Board of Public Works will have completed their engagements with the Dismal Swamp canal company, the Leesburg turnpike company, the Swift Run Gap turnpike company, and will have also completed the payment for the Map of Virginia; and will thereafter have to meet, under existing appropriations, the payment of $ 16,000 to the Falls Bridge turnpike company, in two annual payments; the further requisitions to the Roanoke navigation company, as called for, not exceeding $ 13,600; the instalment which will be due to the Snicker's Gap turnpike company, if they shall have complied with the terms of the law of the last session, which is probable, to the amount of $ 15,000; and any requisitions which may be legally made on account of the stock of the Monongalia navigation company, and which cannot exceed $ 8,470.

The president and directors of the Board of Public Works, deeply lament the loss of their late engineer, Thomas Moore, in whose integrity and judgment they had unbounded confidence. After serving the commonwealth with unremitting zeal and industry for upwards of four years, he died on the 3rd of October last, a victim to his public duties. The board will proceed, in January next, to appoint his successor, and notices have been published to that effect.

In consequence of the death of Mr. Moore, the board have it not now in their power to lay before the General Assembly, the result of his labours, during the last season; but, they hope to be able to do so, before the adjournment of the Assembly.

The members ex-officio of the board, by resolutions, copies of which are annexed, promptly appointed Isaac Briggs, to procure the notes of the surveys and examinations made by Mr. Moore, and to report the effect thereof to the board; and also, as engineer on the part of the state of Virginia, to attend and assist the commissioners appointed in pursuance to the act of Assembly, in relation to the survey and examination of the Potowmac river.

At their last meeting, the Board of Public Works adopted certain resolutions, a copy of which is annexed, prescribing the duties of the engineer, during the then ensuing season. In the month of May, he commenced the survey and examination of the Roanoke river; but, before he had completed that object, he was called upon by the Potowmac commissioners, to attend them; immediately obeyed the call, and before that duty was fully performed, died.

Copies of reports are submitted, from the Little River turnpike company; the Monongalia navigation company; the Falls Bridge turnpike company; the Dismal Swamp canal company; the Roanoke canal company; the James river canal company; the Richmond dock company; the Swift Run Gap turnpike company; the Potowmac canal company; the Leesburg turnpike company, and the Appomattox canal company. No report has been made by the Cartersville bridge company; the board is, however, informed, that the bridge is completed, and promises to be valuable.

Upon these reports, the board has, at present, nothing to remark; some of them will be the subject of further consideration, and probably, (together with Mr. Briggs's expected reports,) of a supplemental report to the General Assembly. They cannot, however, refrain from offering their congratulations upon the state of some of the most important works, particularly those of the Dismal Swamp and Roanoke canals.

All which is respectfully submitted.

JAMES PLEASANTS, Jr.
President Board Public Works.

Bernard Peyton, *Secretary*
to the Board of Public Works.

Richmond, the 23rd of December, 1822.

Extract from the proceedings of the members ex-officio of the Board of Public Works of the 26th of October, 1822, when the following resolutions were adopted:

Resolved, That Isaac Briggs, formerly assistant civil engineer of this commonwealth, and colleague of Thomas Moore, the civil engineer, lately deceased, be and he is hereby empowered to ask for, and receive, from the executors or heirs of the said Moore, all the rough notes of this year's work, as far as actually done, or begun by the said Moore, and to make therefrom the necessary arrangements, calculations and statements, for the annual report to the Board of Public Works, and to prepare and present to the said Board, at the usual period, the said report.

Resolved, That an instrument of writing be prepared, with the seal of the Board of Public Works, and the signature and counter signature of the president and secretary, by which Isaac Briggs may be accredited to the commissioners appointed by the act of Assembly of February the 16th, 1822, entitled, "an act to amend the act concerning the Potowmac company," passed January the 29th, 1821, as the civil engineer of this commonwealth, required to attend them, by the 3rd section of the last recited act, and to "give them his advice and assistance," as the civil engineer of the state of Virginia, and assist them in their report.

Resolved, That the faith of the members of the Board of Public Works ex-officio, be pledged, and it is hereby pledged, to the said Isaac Briggs, to use their utmost endeavours, whether still remaining in office, or gone out, to procure from the board, at its next meeting, a just and liberal compensation, for the services performed under this agreement, taking into consideration the risk and labour, as well as the science, skill, and manual ability requisite therein.

(A true copy.)

BERNARD PEYTON,
Sec'y B. P. Works.

Extract from the journal of the proceedings of the Board of Public Works of the 8th day of February, 1822, when the following report and resolutions were adopted: (viz:)

The committee appointed to prescribe the duties of the engineer, for the ensuing season, report:

That the following subjects require the attention of the Board of Public Works, in consequence of various acts and resolutions of the General Assembly, and of resolutions of the Board of Public Works, not yet executed.

The survey between the Nansemond river and Black Water river, and Sommerton creek, in order to connect the two rivers by a canal.

The examination or survey of the south branch of the Potowmac, the Great Cape Capon river, the North river, and Patterson's creek, from their mouths, to the highest point susceptible of navigation by boats.

The survey or examination of Cheat and Shaver's rivers, from Jackson's works to the highest point to which it is susceptible of navigation by boats: and to ascertain the probable cost and best plan of clearing and improving the navigation of said river.

The examination of Tygart's Valley river in like manner.

The examination or survey of the Roanoke and Rappahannock rivers, above the falls, to the highest point susceptible of navigation.

The survey or examination of Slate river in like manner.

The survey or examination of Mattaponie river in like manner.

Besides these subjects, the engineer is required, by an act of the last session, to attend the joint commissioners of Maryland and Virginia, upon the Potowmac, whenever called on by the commissioners for that purpose: a duty to which, in the opinion of your committee, all other engagements should yield, whenever the engineer shall be called upon for that purpose.

The committee have come to the following resolutions:

Resolved, That the engineer do, in the course of the next season, survey the Roanoke river, as the Roanoke navigation company may require, and do survey, or examine, as he may think most proper, all circumstances considered, the Slate and Mattaponie rivers, and the South branch of the Potowmac, the Great Cape Capon, the North river, and Patterson's creek, according to the directions of the acts and resolutions of the General Assembly, and the resolutions of the Board of Public Works, upon these respective subjects.

Resolved, That so soon as the foregoing resolutions shall be executed, the engineer shall proceed to execute the other surveys, or examinations, mentioned in the preamble to these resolutions, in the order in which he may find convenient, or as may be directed by the members of the board ex-officio, in the recess of the board.

(A true copy.)

BERNARD PEYTON,
Sec'y. B. P. Works.

ALEXANDRIA, D. C. 12th Month, 4th day, 1822.

BERNARD PEYTON, Esq.
Secretary to the Board of Public Works of Virginia.

SIR,

Herewith I have the pleasure of handing thee a copy of the report of the president and directors of the Little River turnpike road company, made to the stockholders at their last annual meeting. as giving the most complete statement and information, relative to the affairs of said company.

By reference to my letter of the 25th of October, 1819, thou wilt find, that Jonah Thompson, esq. treasurer of the Little River turnpike company, did, by order of the board, in November, 1817, write a letter to thee, stating the whole amount expended in forming and paving the full extent of the road from Alexandria to Little River, and the amount of dividends, payable in stock, from the commencement of the work, in 1802, to January, 1817, to which please refer.

The capital stock of the Little River turnpike road company, is one hundred and fifty thousand dollars, on which a dividend of six per cent. has been declared, and paid every year since the year 1815, inclusive.

At the last annual meeting of the stockholders, held in January, 1822, the report of the president and directors (above alluded to) was read, approved and adopted: consequently a dividend of six per cent. was declared, and has been paid as called for.

The plan of the present board, which has met the views of the stockholders, has been, to regularly divide six per cent. per annum, if the income would admit thereof, and expend the balance in making permanent bridges, and cutting down hills, till the road is in complete and perfect order.

Owing to the short crops of grain in the upper country this year, and the consequent small quantity of produce to be brought to market, we have some fear of not being able to divide more than five per cent. for the present year. The meeting of the stockholders takes place next month, at which time the dividend for 1822 will be declared, payable probably in February or March, 1823.

The Little River turnpike road having been made some years since, and a full statement of the cost rendered to the Board of Public Works for the State of Virginia, after the state had transferred the stock held by them, to said board, as a part of their permanent fund, our board considers it unnecessary to render, at this time, any other account than such as is exhibited to the stockholders; as that conveys all the information, it is presumed, that can be required by the Board of Public Works, it being, in fact, as complete as our treasurer can render it without going into a more minute detail than would be desirable to your board to examine.

Respectfully, thy friend,

PHINEAS JANNEY,

President of the Little River turnpike company.

The president and directors of the Little River turnpike company, respectfully report to the stockholders :

That the receipts for tolls for the year ending 31st of December, 1821, amount to		$ 20,367 43
And for fractional parts of shares in paying stock dividends,		84 84
Also, a balance from S. Baird, of $ 99 24, and a fine from a waggoner for forcing gate, $ 9,		108 24
Balance in the hands of the treasurer on settlement of his account for the year 1820,		5,646 30
		$ 26,206 81
There has been expended,		
By James Lewis, superintendent of the upper district on 17 1-2 miles of road, for necessary repairs during the year,	$ 2,319 98	
By Thomas Moss, superintendent of lower district of 16 3-8 miles, including balance paid for completing Roan's contract for cutting down hills between the 13th and 14th mile stones,	3,254 76	
Payment of the salaries of all the gate-keepers,	1,520 00	
Payment of the salaries of two superintendents, at $ 400 each,	800 00	
Salary of the president $ 200, and four directors, each $ 100, as fixed by the stockholders at their annual meeting,	600 00	
Expenses of president and directors on the road, on business,		
Amounts carried forward,		26,206 81

Amounts brought forward,	$ 8,514 69	$ 26,206 81
The treasurer's commission on $ 20,560 51, at 2 per cent.	411 21	
Treasurer's expenses in attending to the affairs of the company,	31 82	
Marshal and clerks' fees, printers' bills, postages, &c.	39 38	
Expenses of erecting an addition to toll-house at gate No. 1,	50 00	
Expenses of stockholders at annual meeting and election,	46 09	
Counterfeit bank notes received by gate-keepers,	16 00	
Paid Ro: Ratcliff on account of bridge erected over Cub Run, work not complete,	300 00	
Paid for half share of stock purchased,	47 50	
Paid dividends for 1820, and balance of 1819,	10,010 79	
		19,467 48
Leaving a balance in the hands of the treasurer, per his account, of		$ 6,739 33
There are debts and property belonging to the company, (nominally,)		1,944 09
		$ 8,683 42
The company owes a balance on cash dividends, not called for, amounting to	$ 939 50	
And dividends declared in 1810 and 1815, payable in stock per treasurer's statement,	890 38	
Amounts carried forward,	$ 1,829 88	$ 8,683 42

Amounts brought forward,	$1,829 88	$8,683 42
There is also, a balance due the state of Virginia, growing out of the collection of muster fines, amounting to five thousand and seventy-six dollars thirty-two cents, subject to the draft of the treasurer of the State, who has had a statement furnished him by our treasurer, more than four years since,	5,076 32	
	$6,906 20	

THE PRESIDENT AND DIRECTORS ALSO REPORT:

It will be necessary to erect a bridge, with stone or brick, over a small stream between the fifth and sixth milestones, in the early part of the ensuing season: and further, that in consequence of the road being now in good order, they believe no extraordinary expense in repairing will be incurred, though they beg leave to state, as their opinion, that the substantial interest of the stockholders, as well as the community at large, will be best promoted by a constant and well directed attention to keeping every part of the road in good order, and as fast as the funds of the company will admit, with propriety, to reduce some hills that are yet too steep, and to erect good bridges, with stone or brick arches, wherever new ones may be required, by the wooden ones giving way.

After examining into the state of the affairs of the company, the president and directors, in obedience to, and in conformity with, a resolution of the stockholders, at their annual meeting in 1819, recommend a dividend of six per cent. for the last year, payable on or before the 5th day of next month, (February,) as the treasurer may be in receipt of funds.

Which is respectfully submitted by

(*Signed,*) PHINEAS JANNEY, *President.*

GEORGE CARTER,
CHARLES LEWIS,
ABIJAH JANNEY,
REUBEN JOHNSON, } *Directors.*

Alexandria, the 9*th of January,* 1222.

Return of the state of the Falls Bridge turnpike company on the 7th day of December, 1822.

Capital subscribed,	$ 80,521 40
Aggregate of requisitions made on stockholders,	56,521 40
Amount paid by stockholders,	52,269 42
Amount due by individual stockholders,	4,251 98
Amount due by the Board of Public Works,	24,000 00
Capital expended in the work,	74,269 42
Tolls received from the 8th day of December, 1821, to the 7th day of December, 1822, inclusive $ 85 87, in hand the said 8th of December, 1821,	840 00
Sums expended out of the tolls, in repairs and improvements &c., salaries of treasurer and toll keeper included,	599 96
Officers' salaries, and expenses of collecting tolls; in detail, treasurer $100, toll keeper $ 250, superintendent $ 200,	550 00
All other expenses, and for what? Inconsiderable, and not ascertained.	
Dividends declared, and when? None.	
Balance of money in hand,	394 29
Debts due by the company? Not ascertained.	
Debts due to the company, otherwise than on account of stock? None.	

GEORGE TOWN, D. C. December, 1822.

To BERNARD PEYTON, Esq. Secretary
to the Board of Public Works of Virginia.

SIR,

Above is a partial statement of the affairs of the company, made out in the form designated by your communication received in July last. The road is but just completed, and I am obliged reluctantly, to present the statement in this imperfect shape, as most of the accounts of contractors and others are yet unsettled, and the amount of debts due by the company not ascertained.

Included in the capital expended in the work, are the sums of $ 9,000, received from the banks of the district of Columbia, as mentioned in a former report; of $ 8,000 received from the branch bank of the United States in Washington, to be returned in February next, on the payment of the first instalment, due to this company, from the Board of Public Works: and $ 1,000, received from the same, and of $ 4,000, received from the Farmers' and Mechanics' Bank of George Town, both sums to be returned on the payment of the second instalment. Out of the last mentioned sum, we were required to pay, $ 597 33, being interest for three years, on the former debt of $ 3,000, due the Farmers' and Mechanics' Bank, and $ 402 67, interest on the $ 4,000, from the 3rd of July, 1822, to the 28th day of February, 1824, when the second instalment, from the Board of Public Works, falls due, from which it is to be paid, leaving but $ 3,000 applicable to active operations: of the balance in hand, $ 240 04, are tolls, and $ 154 25, a balance in the Farmers' and Mechanics' Bank unexpended.

The whole road, to say, from the district line, to Drane's tavern, is now completed.

Respectfully,

Your obedient servant,

JOHN MASON, Jr.

President of the Falls Bridge turnpike [illegible].

Return of the state of the Monongalia Navigation Company, on the 30th day of November, 1822.

CAPITAL SUBSCRIBED?

The capital subscribed is $ 35,000, the amount authorised by law.

AGGREGATE OF REQUISITIONS MADE ON STOCKHOLDERS?

The aggregate of requisitions is $ 21,283.

AMOUNT PAID BY STOCKHOLDERS?

The amount paid by stockholders cannot be accurately stated.

Thomas Chapman, the contractor for one site, was authorised to receive payment from individual stockholders, to the amount of $ 2,600, and in that way received all that was paid him; a settlement has been ordered with him, but his recent death has suspended its completion.

There has been paid to John G. Jackson, the contractor for the remaining seven dams, locks, &c. by the individual stockholders, as per his receipt to the treasurer, being so much due to him from them for the two first instalments on his contract, the sum of $ 6,300; also to same, by said stockholders, to defray the expenses of sites and contingencies, $ 420; also to same on behalf of the state, on his aforesaid contract, by the treasurer, $ 4,200; also to same, by the treasurer, to pay for sites and contingencies, $ 148; also to same by the same, to re-pay the sum of $ 125, and interest thereon, advanced by him, in addition to his instalments to pay for the land at the site improved by Chapman, $ 152; total $ 11,220.

AMOUNT DUE BY STOCKHOLDERS?

The amount due cannot be correctly ascertained, without a previous settlement with Chapman's administratrix.

AMOUNT DUE BY THE BOARD OF PUBLIC WORKS?

There is nothing due therefrom.

CAPITAL EXPENDED IN THE WORK?

The capital expended consists of the amount at the site improved by Thomas Chapman, and exceeds the sum of $ 2,600, but to what amount, is not ascertained: it is set down, including the sum of $ 152, paid as aforesaid, for money advanced thereat, at $ 2,600; also of the sums paid to John G. Jackson, contractor, exclusive of said $ 152, amounting to $ 11,068. Total $ 13,668.

TOLLS RECEIVED?

No tolls have yet been received, the work being incomplete.

OFFICERS' SALARIES, &c.?

No salaries have been hitherto fixed or paid: there are several claims to compensation, none of which have been acted on.

ALL OTHER EXPENDITURES, AND FOR WHAT?

There have been expenditures other than those enumerated, for record books, recording deeds, fees of clerks, sheriffs, &c. These have been defrayed by individual stockholders, and have not been adjusted or reimbursed.

BALANCE OF MONEY IN HAND?

The treasurer has received from the Board of Public Works, the sum of	$ 5,530
And has paid as above stated,	4,500
Leaving in his hands to be accounted for,	$ 1,030

DEBTS DUE BY THE COMPANY?

The amount of the recent contract, for seven dams, locks and slopes, is $ 21,000. In addition to this sum, there will be, at each of said sites, an extra expense for the land, &c. of $ 300, as is supposed, $2,100; of which amount, there has been paid, as above, $ 11,068, leaving a balance of $ 12,032.

DEBTS DUE TO THE COMPANY, OTHERWISE THAN ON ACCOUNT OF STOCK?

The company have a claim against the estate of Thomas Chapman, for the rent of the mills at the site he improved;

but how the balance will be on a settlement, they cannot state.

NOTE. An abstract from the record book, of all the orders made during the present year, is herewith transmitted: of this document, such use can be made, to explain the transactions of the board, during that period, as may become necessary. It will thereby appear, that *after* the contract was made for building the dams, locks &c., required on the West fork, below the "company dam," it was ordered, that payments made by the individual stockholders, to the contractor, to the amount of the instalments called for, should be valid. This measure was deemed to be altogether expedient and correct, and was a saving of expense to the amount of a just commission, on the money to the treasurer: and as it respected the stock of the contractor, amounting to 134 shares, it would have been idle for him to pay the instalments on his stock, and instantly withdraw them, in virtue of his contract. Chapman's contract formed a precedent for this resolution: he received from the stockholders, the requisite aids in money, labour, materials, &c. and it was found to be mutually convenient and beneficial, in the absence of a sound circulating money medium. Although this course was not in express accordance with the letter of the act by which the state quota was *demandable*, and therefore, if there had been a rigid adherence to the letter, regardless of the spirit, the said quota would not have been paid; it was deliberately resolved on, and the certificates pointed out by law, drawn in conformity to the fact, in preference to the mere formality of a payment to the treasurer by, or on behalf of the stockholders, which was payable, and would have been paid to the contractor, so soon as the certificates had been signed.

With regard to the performance of the contract, there has been a considerable delay in procuring and designating the sites for the dams, in consequence of the effort, in every case successful, to purchase them, instead of resorting to the authority to condemn. This has produced a corresponding delay in the performance of the labour; but it is, nevertheless, confidently asserted by the contractor, that he can complete the whole the ensuing year; and judging from his known ability, and the progress he has made in his own extensive water works, we think we may safely rely upon his assurances.

(Signed,)

L. E. DAVISSON, *President pro tem.*

Teste, JONA. JACKSON, *Secretary.*

At a meeting of the directors of the Monongalia Navigation Company at Webster's office, in the town of Clarksburg, on the 16th day of April, 1822:

Present, John G. Jackson, president; Daniel Morris, Lemuel E. Davisson, Edwin S. Duncan, Jacob Coplin, William Martin, and Jonathan Jackson, the following preamble and resolution were adopted:

Whereas it appears to the directors of the Monongalia Navigation Company, that from the terms of the existing laws, regulating said company, it is doubtful whether said company can beneficially carry into effect the objects for which said company were created: *Therefore be it resolved*, That the stockholders be requested to meet at Clarksburg, on Saturday next, to take into consideration the propriety of surrendering its charter.

Ordered, That this board be adjourned to Saturday next.

J. G. JACKSON.

◆

Saturday, 20th of April, 1822—The following stockholders met, pursuant to the resolution of the board at the last meeting, viz: John G. Jackson, William Martin, Daniel Morris, David Hawes, Lemuel E. Davisson, Edwin S. Duncan, Warner W. Chapman and Jonathan Jackson.

John G. Jackson was appointed president of this meeting, and Jonathan Jackson secretary.

And the question being put thereupon, on the propriety of surrendering the charter, was decided in the negative. Jacob Coplin appeared, and the directors formed themselves into a board, whereupon Edwin S. Duncan was appointed president pro tempore.

Ordered, That Jacob Coplin, Daniel Morris and Edwin S. Duncan, be appointed commissioners to enter into a contract with John G. Jackson for the erection of the necessary number of dams, locks and slopes, that shall be rendered necessary to complete the navigation of the West Fork river, from the company dam, to the confluence of the Tygart's Valley river, upon the following principles:

1st. The company to pay to John G. Jackson twenty-one thousand dollars in the following manner: one fourth in sixty days, one fourth in six months, one fourth of said sum in nine months, and the residue when the work is completed. The said John G. Jackson, binding himself to erect as many dams, locks and slopes, at such places as shall be designated, across the West Fork river by the company, together with a saw mill at each dam, and to complete one half of the work during the present year; and the residue against the first day of December, 1823. The number of dams, their height, &c. and the place of their locations, to be designated by the company. The materials and plan of construction of said dams, locks and slopes and saw mills, to be prescribed in the said contract. The commissioners taking from said Jackson security for the performance of said contract.

Ordered, That Thomas Chapman be requested to construct a slope at the company dam, of the width prescribed by the existing law; and to sink said slope eight inches below the present height of the dam, and raise the residue of the dam eight inches: And that in a settlement with said Chapman, if he claims any compensation for raising said dam, that the justice of such claim be submitted to arbitrators to be mutually chosen for their decision.

The contract made by the company and John G. Jackson, for the erection of dams, &c. is in the following words and figures, to wit:

"An agreement made and entered into between Jacob Coplin, Daniel Morris, and Edwin S. Duncan, commissioners on behalf of the Monongalia Navigation company, with John G. Jackson, as principal, and John Webster, and Jacob Stealey, as securities of said John G. Jackson, witnesseth: Whereas the said John G. Jackson covenants and binds himself to erect for the said Monongalia Navigation company, as many dams across the West Fork river, from the company dam at Chapman's to the confluence of the Tygart's Valley and West Fork rivers, as the board of directors of said company shall require; said dams to be of the height, and at such sites as shall be designated by said directors. The said dams to be composed of good white oak logs in front, and to be hewed on three sides; and when hewed, to be at least   inches thick. The back logs to be white oak, and to be placed 12 feet from the front, and to be attached to the front logs by ties, dove-tailed; and the space between the back and front logs to be well filled with stones. The logs in front to batter two inches to the foot, and the dams to be planked, with white oak plank, at least an inch and an half, to be spiked or pinned on, and made sufficiently tight and close to hold the water. The said Jackson further covenants and agrees to erect a lock at each of said dams, to be 70 feet long and 16 feet wide, together with a saw-mill the saw-mill to be completely finished, and put into operation, and to be composed of the following materials, and in the following manner: The posts and sills to be 12 inches square, and the posts to be three feet from centre to centre, the frame to be 16 feet wide, and fifty feet long. The said posts and sills to be of sound oak timber, to be covered with a good roof, and so constructed as to saw stuff 25 feet long. The locks to be constructed adjoining the saw-mill, to be secured on the water side by a crib six feet wide, of hewed oak timber, raised above high-water-mark, well filled with stone, and covered over, and so secured as to resist the current, ice, &c. The said locks to be well planked with inch and an half white oak plank, well spiked on. The gates of said locks to be well constructed of sound materials, well hung with iron, and supported by bars and rivets. The said Jackson also agrees and binds himself to erect at each of the said dams, opposite to the lock, a slope of the dimensions, and upon the model prescribed by law concerning the said company: The said slope to be made of framed oak timber, well fastened by dove-tailed tenants, and filled with stone, and covered with inch and an half oak plank, spiked or pinned on. The whole of said work, including the dams, locks, slopes, and saw-mills, to be well and substantially made, and to be subject, in their progress, to the inspection and direction of commissioners to be appointed by the said board of directors. The said Jackson furthermore binds himself to construct good and substantial abutments to each of said dams; said abutments to be well secured, and at an elevation above high-water-mark. One moiety of all of the foregoing work the said Jackson binds himself to perform during the present year, and the whole to be completely finished against the first day of December in the year 1823. In consideration of the foregoing covenants and undertakings of the said John G. Jackson, the said Jacob Coplin, Daniel Morris, and Edwin S. Duncan, for and on behalf of the Monongalia Navigation company, covenant and agree, that the said company shall pay to the said John G. Jackson, out of the joint funds of said company, the sum of twenty-one thousand dollars, in the following instalments, to wit: One-fourth thereof in sixty days from this date; one-fourth thereof in six months from this date; one-fourth thereof in nine months from this date, and the residue when said Jackson shall have completed said dams, locks, and slopes, and saw-mills, according to his aforesaid undertaking. It being also the understanding of the parties, that the said company will proceed as early as practicable, so as not to create any hindrance or delay to the said Jackson, in proceeding to the performance of his said undertakings, to procure and designate the sites of the several dams, so to be erected, as aforesaid, together with the height of said dams; and for the performance of the aforesaid agreement on the part of the said Navigation company, the said Jacob Coplin, Daniel Morris, and Edwin S. Duncan, bind themselves, in their official capacity, to the said John G. Jackson; and the said John G. Jackson, and the said John Webster, and Jacob Stealey, his securities, bind themselves, their heirs, &c. to the said Coplin, Morris, and Duncan, for and on behalf of the said company, that the said John G. Jackson shall well and truly do and perform his aforesaid undertaking. In witness whereof, the said parties have hereunto set their hands and seals this 26th day of April, 1822.

JACOB COPLIN, (Seal.)
D. MORRIS, (Seal.)
E. S. DUNCAN, (Seal.)
for and on behalf of the Monongalia Navigation company.
JOHN G. JACKSON, (Seal.)
J. WEBSTER, (Seal.)
JACOB STEALEY, (Seal.)

Teste,
JONA: JACKSON.

Ordered, That the board do now adjourn.

E. S. DUNCAN, *P. Pro tem.*

At a meeting of the board at Webster's office, on the 17th of June, A. D. 1822:

Present, John G. Jackson, president; William Martin, Daniel Morris, Jacob Coplin, Lemuel E. Davisson, and Jonathan Jackson:

Jacob Coplin was called to the chair:

Ordered, That the stockholders of this company pay to the treasurer thereof, seventeen per centum on the amount of their stock on the 26th June, instant; also, in like manner, the sum of seventeen per centum on the 26th of October next; also, the further sum of seventeen per centum on the 26th of January next.

Whereas, John G. Jackson has entered into a covenant, with good and sufficient sureties, to build for this company the necessary dams, locks, and slopes, &c. from the company dam to the mouth of the West Fork river; and the said company, on their part, have covenanted to pay him, in consideration thereof, twenty-one thousand dollars, as follows: 5,250 dollars, on the 26th day of June, instant; also, 5,250 dollars, on the 26th day of October next; also, 5,250 dollars, on the 26th day of January next; and the residue, of 5,250 dollars, when the work is completed: And, whereas the said Jackson is a large stockholder, and it is unnecessary to require of him to pay in the several instalments of seventeen per centum each on the days aforesaid, inasmuch as he would be entitled at the same time to have the same repaid to him, on his aforesaid contract: *It is ordered*, That, upon his giving a receipt to the treasurer, for the sum of seventeen per centum on his said stock, on or before the 26th of June, instant; also, seventeen per centum on the same, on or before the 26th of October next; also, seventeen per centum on the same, on or before the 26th of January next, for and on account of the contract aforesaid, the said treasurer be, and he is hereby required to give to said Jackson receipts for the instalments aforesaid, paid on his said stock, and to charge him therefor, on the contract aforesaid.

Ordered also, That payments made to said Jackson by any stockholder of the three instalments of seventeen per centum each, or any part thereof, which is called for by the order of this day, shall be valid, and on producing the receipts of said Jackson therefor, the treasurer shall charge the same to the said Jackson, and grant receipts to such stockholder for th amount so paid, specifying therein how paid.

Ordered, That the treasurer proceed forthwith to draw f the Board of Public Works, their prop [illegible] he su twenty-six hundred dollars, which had [illegible] by company, prior to the 22nd of March, 1821; which expenditure has been certified by the president and directors of this company to the Board of Public Works in their last annual report.

Ordered, That the treasurer proceed in like manner, so soon as enabled so to do, to draw from the Board of Public Works, their quota of the sums which will be due and payable to John G. Jackson, and that from the first monies that come to his hands he pay to said Jackson the commonwealth's proportion of the instalments, which may or shall be payable to him.

Ordered, That the treasurer also pay to said John G. Jackson, the sum of one hundred and twenty-five dollars and interest thereon, which sum was advanced by him to pay for the land on which the works of this company are erected, in addition to the instalments on his stock, paid to the contractor.

Ordered, That John G. Jackson, Lemuel E. Davisson, Jacob Coplin and Jacob Israel, or any two of them, be a committee to fix upon the sites for the dams between the company dam and the mouth of the West Fork; to purchase said sites, to have writs of ad quod damnum executed, and to report from time to time their proceedings to this board.

Ordered, With the assent of the contractor, that the slopes to be built by John G. Jackson be erected adjoining the locks.

Ordered, That a transfer of stock, made in writing under the hand and seal of a stockholder, and acknowledged before a justice of the peace, shall be valid, on the transferree entering his acceptance thereof, on the record book of this company as heretofore.

Ordered, That the board do now adjourn.

JACOB COPLIN, *President pro tem.*

At a meeting of the board on the 19th of June, 1822: Present John G. Jackson, president; Jacob Coplin, Daniel Morris, Lemuel E. Davisson, and Jonathan Jackson, directors.

Ordered, That it be certified to the Board of Public Works, that the expenditure made by the Monongalia navigation company in the improvement of the navigation, prior to the 2d day of March, 1821, exceeds two thousand six hundred dollars.

Ordered, That the board do now adjourn.

J. G. JACKSON.

At a meeting of the board on the 10th day of August, 1822: Present, John G. Jackson, president; William Martin, James McCally, Lemuel E. Davisson, and Daniel Morris.

Jonathan Jackson having vacated his office as a director of this board, by a transfer of his stock: *It is ordered*, That William A. Harrison be appointed a director in the room of the said Jonathan; and the said William A. Harrison having accepted said appointment, was sworn into office by Wm. Martin, esq. a member of this board.

Ordered, That the contracts entered into with William Wood, and David Tichenal, on the 2d day of August instant, be, and the same are, hereby ratified and approved of by this board; and it is further ordered, that the same be recorded.

Ordered, That John G. Jackson be authorised to receive from the treasurer of this board the sum of five hundred dollars to defray the expenses of paying for sites for dams, &c.; and that the said Jackson report an account of such expenses to be approved of by the board.

Ordered, That Edward B. Jackson be appointed a director of this board, in the room of Edwin S. Duncan, resigned.

Ordered, That John G. Jackson be authorised to contract for building a log house, not exceeding twenty by thirty feet, at each of the above sites, and no charge to be made for the plank, to be furnished for the floors of said houses.

Ordered, That the board do now adjourn.

J. G. JACKSON.

At a meeting of the directors on the 23d day of November, 1822: Present, John G. Jackson, Jacob Israel, James McCally, William A. Harrison and Lemuel E. Davisson.

Lemuel E. Davisson was appointed president *pro tempore.*

Ordered, That the contracts made by John G. Jackson, on the 13th instant, with William Holbert, and with Benjamin Reeder, on the 19th instant, for the sites for dams, &c. for the use of this company, be, and the same are hereby ratified and approved of by this company, and that the same be recorded.

Ordered, That the board be adjourned to Saturday next, and that the members be requested to attend for the purpose of making out the annual report for the present year.

L. E. DAVISSON,
President pro tem.

◆

The board met on Saturday, the 30th of November, 1822, pursuant to adjournment: Present Lemuel E. Davisson, Jacob Israel, John G. Jackson, James McCally, William A. Harrison, and Wm. Martin.

Lemuel E. Davisson was appointed president pro tempore.

The annual report for the present year was agreed to, which is ordered to be certified, by the president and secretary, to the Board of Public Works, and it is further ordered, that the same be recorded.

Ordered, That the board do now adjourn.

L. E. DAVISSON,
President pro tem.

Teste, JONA. JACKSON, *Secretary.*

The foregoing ten pages contain a correct transcript of the record and proceedings of the president and directors of the Monongalia Navigation Company, at their various meetings from the 16th of April, 1822, to the 30th November, 1822, inclusive, being all the orders entered into since the last annual report.

JONA. JACKSON, *Secretary.*

November 30th, 1822.

Extracts from the minutes of said board, 26th July, 1819.

Ordered, That the treasurer of this board admit a credit to each stockholder for such sum, or sums, which he, or they, may have or shall pay, to Thomas Chapman, on producing the receipt of said Chapman, so that the same does not exceed one per centum on each share.

◆

February 10th, 1820—*Ordered,* That the treasurer of this board admit a credit to each stockholder for such sum, or sums, which he, or they may have, or shall pay to Thomas Chapman, on producing the receipt of said Chapman, so that the same does not exceed two per cent.; which two per cent. is in addition to the one per cent. heretofore allowed to be received by said Chapman by a former order of this board.

Copies—Teste,

JONA. JACKSON, *Secretary.*

NORFOLK, 8th December, 1822.

To the President and Directors
of the Board of Public Works.

GENTLEMEN,

The directors of the Dismal Swamp Canal company, herewith present a statement of the affairs of the work committed to their management and superintendence, in the form required by the Board of Public Works.

The information to be derived from this exhibit is not as full and satisfactory, as the directors could desire to impart, in consequence of the labors of the present season not being entirely completed, (but nearly so,) and, consequently, the expenditures of the company not fully ascertained. The actual state, or the condition of the company, as regards their pecuniary concerns, is shewn by the accompanying return, as far and as fully as is practicable at this time, with the exception of the last instalment of the loan of fifty thousand dollars made to this company by your board. This instalment is due early in the next month; and, by the return now made, would appear to be at the disposal of the directors, in the further prosecution of the work, to its completion.

The greater part of this instalment, of twelve thousand five hundred dollars, has been, however, anticipated, and expended, in the labors of the present season; and their sole reliance must be on the receipt of tolls, to execute what remains to be done, to obtain a good and sufficient navigation.

In presenting, for the information of your board, a view of our operations on the canal, since our last annual report, we beg leave to submit a few preliminary observations: By referring to that report, it will be perceived that we had contemplated the erection of a stone lock at the south outfall of the canal, during the past summer. Various considerations induced a change in this plan of operations. Upon inspecting the present lock at Joyce's creek, and that between it and the stone lock, erected in 1819, we found those two locks, with small repairs, would answer very well for some years, affording, from one to the other, no where less than four feet water.

We then turned our attention to the space from the stone lock above mentioned, to that at Deep creek.

Experience has demonstrated the increased expense, and other inconveniences, from a multiplicity of locks: by changing the levels, the embankments have been raised; and we have been enabled to dispense with three locks, with their keepers; and now have, between the new stone lock at Deep creek, and that erected in 1819, a space of eighteen miles navigation, no where less than six feet.

Near the North-West river a lock had been injudiciously placed, and greatly interrupted the navigation. To take it up, and erect another on a more eligible site, became indispensible: Both have been effected, forming a considerable part of our labor and expenditure the past summer; and all the inconveniences have been removed by the new lock, upon an improved plan. Another, and important object, to which our attention has been directed, was the completion of the stone lock at Deep creek, which has been accomplished. It is now in use, and answers our most sanguine expectations.

The raising the banks with the views mentioned, has formed a very large proportion of our expenditures, particularly as we approached the lock at the north out-fall; from which, to the junction of the old canal, about eight hundred yards, a basin has been formed one hundred feet wide and nine feet deep. The embankments have been carried south, nearly three miles further, increasing the width of the canal, for that distance, from sixty to seventy feet, the earth for raising the banks being taken out of the canal.

Although we do not contemplate immediate additional work, for reasons already suggested, we are satisfied that it will hereafter become indispensible, to erect a stone lock at the south out-fall on Joyce's creek. This, with the embankments for about half a mile, may be estimated at twenty-five thousand dollars. To connect the north-west river with the canal, is an object of primary consideration, and can be undertaken and completed without any interruption to the navigation of the main canal.

Although not a part of our operations, we have thought it proper to state, for the information of the Board of Public Works, that the White Oak marsh canal, which joins the main canal about six miles from Joyce's creek, has been completed, affording batteaux navigation from the canal, into Gates county, in North Carolina, a distance of about nine miles.

The navigation of the canal was suspended early in the summer, and was resumed on the fifth of the present month.

(Signed,)

JOHN TUNIS,
JOHN COWPER,
GEORGE McINTOSH,
JOHN TABB,
} *Directors of the Dismal Swamp Canal company.*

Return of the state of the Dismal Swamp Canal company on the 8th day of December, 1822.

Amount due by the Board of Public Works, (next January,)	$ 12,500 00
With this sum received,	37,500 00
Make the amount of loan of	$ 50,000 00

Capital subscribed and paid in by stockholders,	$ 160,000 00

Capital expended in the work, viz:

Amount of account of general expenditures,	$ 333,994 52
Do. do. " stone locks,	65,348 58
Do. do. " discount,	8,178 21
Do. do. " contingent expenses,	190 45
Do. do. " interest,	2,973 80
Do. do. " M. McPherson, contractor, on account,	3,800 00
Do. do. " R. Hall, do. do.	1,200 00
	$ 415,685 56

Tolls received up to the 1st December, 1821,	$ 96,058 39
Do. do. from that time to this,	4,364 94
Making together, and all expended,	$ 100,423 33

In consequence of the great improvements made in the canal this year, the navigation was suspended until the 5th of the present month, when it was resumed.

OFFICERS' SALARIES, &c.

Mr. Parks, superintendent and engineer, (pr. year,)		$ 1,200 00
Garret, overseer of workmen,	do.	360 00
Carr, toll-keeper,	do.	360 00
Two lock keepers, (each,)		144 00

Dividend declared? None at any time.

Balance of money in hand? None; but the next and last instalment of loan due in January next, from the Board of Public Works, is	$ 12,500 00
Which is nearly exhausted by loans predicated upon the same.	
Debts due by the company to sundry individuals, &c.	$ 17,126 48
And by accommodations to the banks, of which $ 50,000, is on stock pledged,	108,500 00
Together,	$ 125,626 48
Debts due to the company, otherwise than on account of stock: by sundries,	$ 4,652 85*
Do. do.	3,211 40 ‡
	$ 7,864 25

Norfolk, the 8th day of December, 1822.

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* *This sum is charged to the commissioners who superintended the lottery, and is the amount of the loss the company sustained by the two lotteries which they drew.*

† *This sum the company had to pay for real estate, damages incurred by individuals in cutting the canal.*

HALIFAX, N. C. 20th November, 1822.

To BERNARD PEYTON, Esq. Secretary of the Board of Public Works of the State of Virginia.

SIR,

I herewith transmit to you, for the use of the Board of Public Works of the State of Virginia, the annual report of the president and directors of the Roanoke Navigation company.

I am, very respectfully,

Your obedient servant,

A. JOYNER.

Report of the president and directors to the stockholders of the Roanoke Navigation Company.

The work done on the Roanoke canal during the present year is, as follows:

All the cutting which remained to be done at the last annual meeting, except five or six days work, at and about the basin.

The blasting at, and walling and banking around the point of rocks in Col. Joyner's plantation, and the erection of four waste weirs.

The blasting the pit for the fourth lock; a very tedious and expensive job.

The erection of the guard lock at the entrance to the canal.

The laying up of two stone locks at the middle ground, and the preparing stone and laying up three-fourths of the other two locks at the same place.

The preparing all the cut stone for the aqueduct at Hudson's mill, with the exception of about ten days work.

The erection of a bridge across the canal where the road leading to Moore's ferry intersects it.

The excavating a basin above the two first locks, at the middle ground, and securing these locks with a line of puddling and banking on the outer side.

Building a bank from the foot of the second lock to the head of the third, and forming a basin there.

Erecting a stone wall above the entrance to the canal to secure it against drift wood in freshets; to which may be added, the transportation of upwards of seven thousand feet of hewed stone, a distance of thirteen miles.

Since, from the last annual report, the stockholders had reason to expect the entire completion of the canal by this time, it becomes the duty of the directors to shew why that expectation has not been realized. Those who have paid the least attention to the progress of this canal, must have perceived that the stone work, connected with it, has presented the greatest difficulty they have had to encounter; and this has arisen from the want of mechanics in this part of the country conversant with that kind of work, and the necessity we have been under of drawing such from the northward. These men entertain the greatest fears from the effects of our climate during the summer and fall; and it is with the utmost difficulty, that we have been enabled at any time to retain them here longer than from the commencement of winter to the last of June.

The consequence has been, that our stone work has been executed in the winter and spring, the most unfavorable seasons for works of the kind, and the more suitable ones of summer and fall have been entirely lost to us: and hence, the slow progress of all our stone work. In order to obviate these inconveniences, and to have the guard lock, the fourth lock at the middle ground, and the aqueduct completed at the earliest possible period, a contract was made last winter, with a Mr. James Olcott from the New-York canal, who, it was believed, had influence enough at the north, to bring on a sufficiency of hands to complete the job in a few months, and before the sickly season should commence. By the terms of this contract, all the month of June was allowed him to finish his job in, and from his conversation and high recommendations, the superintendents were led to place confidence in his capacity for executing it. But it has been our misfortune, to have been grossly imposed on, and deceived by him. He commenced operations, it is true, with apparent vigour, and brought on to the work, a parcel of excellent mechanics from the north; but it seems more with a view of swindling them, the company, and the neighbouring people who would trust him, than for the purpose of executing his engagements. On the 10th of May, he secretly abandoned his work, without the superintendents' having had the most distant idea of such an intention, and carried with him whatever he could get; the company's pecuniary interests were, however, so well guarded, that they have sustained little or no injury of that nature from him. As soon as the character of his departure was clearly ascertained, his men became contumacious, and were with great difficulty persuaded to engage, to remain two months, at the expiration of one of which some of them happening to fall sick, the others became panic-struck, and no inducement could be offered sufficient to detain them. Thus, in the month of June, was the work abandoned, at a time when it was utterly out of the power of the superintendents to get other hands, before the sickly season would set in. Under these circumstances, they used the discretionary power with which they were invested, and determined to put in a guard lock of wood, and to convert the stone prepared for it, to the fourth lock and aqueduct, by which means they secured the important advantage of immediate protection to the canal from the influence of freshets to which it laid open, and diminished the demand for the labour of northern mechanics so difficult to be procured. The guard lock is thus disposed of, and the state of the other works, namely, the aqueduct and fourth lock, and the arrangements made to complete them, are such as to justify the belief, that they will be finished by Christmas. Probably a fourth part of the two lower locks, are yet to be laid up, and the aqueduct is to be built; the cut stone for them as before intimated, and other materials, except some backing stone for the aqueduct, are all prepared.

We have taken measures to cause the existing laws on the subject of falling trees into the river, and otherwise obstructing its waters, to be respected, and we invite such of you, gentlemen, as reside near the river, to aid in the furtherance of this important object: there will be little use in making improvements, if this fruitful source of obstruction is permitted to continue.

Among the objects which have claimed the attention of the directors during the present year, the very important one of having surveys made of the river, both above and below the great falls, has not been omitted, and from the known ability of the gentlemen to whom these operations were confided, we are satisfied that the ablest schemes of improvement will be offered for our adoption. The survey below the falls was taken in charge by Hamilton Fulton Esq. civil engineer for North-Carolina, and that above the falls by Thomas Moore Esq. civil engineer for the state of Virginia.

Mr. Fulton's report we are in momentary expectation of receiving, and Mr. Moore's was promised us by the present meeting; but we lament to say, that his death, which recently occurred, will, in all probability, prevent our getting it in some time to come. For present purposes, however, some letters from him to the president of the board, have, in a measure, unfolded his views, and will suffice; and, in addition to these, we may shortly expect a report on the same part of the river from Mr. Fulton, made at the instance of the board for internal improvement of North Carolina. Until these reports are received, we will not definitively adopt any plan of improvement for those parts of the river which are the subjects of them; but, at the same time, we are not without particular views in relation to them. On the river below the great falls, we contemplate such improvements as will give a depth of four feet of water at the shallowest places, during the driest seasons, and seven feet during ordinary seasons; and for the river above these falls, such as will bear some proportion to the great work we are now about to close at this place. Four feet of water on the lower river will allow of the passage of such boats as can navigate the Albemarle sound in safety, and this is considered the great desideratum in relation to the lower navigation. The river above affords long sheets of fine water, intercepted occasionally by small shoals; these, being neither very many nor extensive, should be improved in the best manner. An ordinary sluice navigation would afford a very inadequate connection between such pieces of fine water as the river between this and the Danville and the Seven Island shoals, is represented to afford, and would bear no proportion to your canal. Indeed, this great work would seem to have been done to very little purpose, if others, on which its utility depends, should be effected in a slight and imperfect manner. Our route to market being a very lengthy one, it must be better than other routes in order to draw the trade, and we do not conceive that all will have been done for this river which ought to be done, until the navigation is rendered so easy, that the same hands who raise the crop can transport it to market; that every planter can navigate his own boat; for, so long as art and nice management are required to take a boat up or down the river in safety, so long will its planters be subject to fraud and imposition.

The subject of locking into the river from the basin at Weldon's, having occupied a considerable deal of public attention, the directors, at the spring meeting, availed themselves of the presence of the North Carolina and Virginia engineers, and asked an expression of their opinion. Mr.

Moore did make a report on this subject, previous to his leaving this neighborhood; and, his views corresponding with our own, we beg leave to refer you to the following extract from his report: "In the present state of the company's concerns, it is my opinion that it would be improper to lock into the river at this time. When the upper sections of the river are so improved as to admit of the descent of large quantities of products, the subject may very properly be taken up; but, previously to determining on the site for the locks, it will be necessary to ascertain, with great accuracy, in the lowest water, the depth of the shoals near the basin; of what they consist; whether they can be easily removed; and, if not, whether an artificial depth can be effected, by means of swelling over them, without producing in any place too strong a current for the ascent of large vessels. These enquiries will probably have weight in determining the site and expense of the locks. If it should be ascertained, that these falls cannot be so improved as to admit the passage of the vessels that usually navigate the river below, when fully laden, it may become a consideration whether the two lower locks ought not to be placed below these falls, and to be of sufficient capacity to pass these vessels; and that the canal thence to the warehouses should be deep enough to admit their taking in their lading at that place." Mr. Fulton's report on this subject has not yet been received.

For the expenses of the present year, as well as an estimate of expenses yet to be incurred in completing the canal, and for a general view of the financial concerns of the company, we beg to refer you to the report of the treasurer of the company, herewith laid before you, and which we ask you to receive as a part of our report. From this exhibit it will appear that $ 38,465 16, have been paid out during the present year; which sum being added to the expenditures up to the last general meeting, will give a total of expenditures of $ 259,200 17, in which is included real estate and negroes. We invite you to an examination of our accounts and vouchers.

(Signed,)

CAD. JONES, *President,*
SAM. PANNILL,
DAVID CLARK,
R. APPERSON,
WM. E. BRODNAX,
JAMES BRUCE,
JOHN R. EATON.

11th November, 1822.

To the president and directors of the Roanoke Navigation Company.

The undersigned, treasurer of the Roanoke navigation company, respectfully reports; that since the last annual meeting there has been received into the treasury,	$ 34,040 25
To which add the sum then remaining in the treasury, to wit:	14,172 99
Make the total sum of,	$ 48,213 24
And that during the same period, the disbursements made on account of canal expenses have amounted to,	38,465 16
Leaving in the treasury at the present time, a balance of	$ 9,748 08

By reference to the delinquent list herewith submitted, it will be seen that there is now due to the company, on account of various instalments, the sum of	$ 15,144 49
From this sum deduct the amount due from insolvent stockholders,	6,247 65
There will then remain due to the company, which may be collected, the sum of	$ 8,896 84
To which add balance due for negroes sold, on which judgments have been obtained,	1,637 50
Judgment against the late treasurer,	1,198 61
Balance in the treasury as above stated,	9,748 08
Making the total sum of	$ 21,481 03
The claims against the company, together with the probable expense of finishing the canal, may be estimated at	19,160 00
	2,321 03

And consists of the following items:

Balance due David Houston,	$ 5,000
Davis & Palmer,	7,000
Expense to complete the aqueduct,	4,000
For hire of negroes,	8
Amount carried forward,	$ 16

Amount brought forward,	$16,850
Debt due John Fulgham,	160
Officers and overseers,	2,000
Remaining work to be done at the basin,	150
	19,160

From the foregoing view which I have exhibited of the pecuniary affairs of the company, it will be seen, that provided collections can be made in due time from delinquent stockholders, the funds of the company, without any further requisition on the stockholders, will not only be amply sufficient to meet every expense necessary to complete the canal, but will leave a balance in the treasury unexpended, which, with any further requisitions you may think proper to levy, may be applied to the improvement of the navigation of the river above and below the Great Falls.

A. JOYNER.

November 11, 1822.

Return of the state of the Roanoke Navigation Company on the 11*th day of November*, 1822.

Capital subscribed,	Aggregate of requisitions made on stockholders,	Amount paid by stockholders,	Amount due by individual stockholders,	Amount due by the Board of Public Works,	Capital expended in the work,	Tolls received,	Sums expended out of the tolls in repairs and improvements,	Officers' salaries and expenses of collecting tolls *in detail*,	All other expenses, and for what?	Dividend declared, and when?	Balance of money in hand,	Debts due by the company,	Debts due to the company, otherwise than on account of stock,
$ 387,000	73 per cent. equal to 282,510	*A.* 267,365 51	15,144 49	Nothing.	*B.* 259,200 17			Superin'ts, $1,200 Treasurer, 300 Clerks, - 300 $1,800	Works not finished, still progressing.		*C.* 9,748 08	15,010 00	$1,637 50

A. This sum paid by stockholders, is exclusive of interest.

B. In this sum is included $ 32,345 67 paid for negroes,
And 2,814 70 paid for land condemned for the use of the company, through which the canal passes.
$ 35,160 37

C. To this sum may be added, the amount due from the late treasurer, for collections made by him from stockholders, and for which judgment is obtained, $ 1,198 61.

By order of the board of directors,

A. JOYNER, *Secretary.*

RICHMOND, December 5th, 1822.

BERNARD PEYTON, Esq.
Secretary of the Board of Public Works.

The James river company respectfully report to the Board of Public Works:

That, about the time of their last report, a negociation was pending with William Caruthers of Rockbridge county, which soon after terminated in a contract with him to make the road contemplated by law from the mouth of Dunlap's creek to the Great Falls of Kanawha; which was approved by the road commissioners, and which, we are informed, is now under a pretty rapid state of execution.

It was deemed important to the proper completion of that work, that the company should have a competent agent to superintend its faithful execution; and colonel William Anderson of Botetourt has been appointed to that office, and we understand has diligently attended to its duties. A copy of the contract with Mr. Caruthers will be furnished, if deemed necessary by the board.

The company made large preparations for carrying on the improvements on the Kanawha river during the late season, in hopes that the work there would have been nearly completed by this time. They have had from one to two hundred hands employed, aided by considerable machinery; but, in consequence of repeated, and almost continued freshes in the river, the expense has been very great in proportion to the work done. They have found it also very difficult, if not impossible, to procure faithful and diligent laborers; and it is now very questionable whether they will not be obliged to purchase slaves in order to ensure the necessary labor for its completion.

As to the improvements on the James river, they have not as yet advanced as far as the coal district; although considerable work on the whole line has been done. The canal would have been completed, but for the difficulty of procuring a condemnation, according to law, in one plantation.

It is respectfully suggested, that legislative aid is necessary on this subject. It is said that in New York the law provides that the work shall proceed, notwithstanding the pendency of any dispute as to the condemnation; and, with the exception of the owner of the above farm, we have, by consent, gone on with our work on the residue of the canal, before regular condemnations: where this, however, is refused, it is found that great delay and inconvenience to the work must be the result.

Contracts have been made, and partly executed, for all the lockage, guard gates, aqueducts, &c. necessary, except the dam across James river, for the purpose of feeding the canal; which latter, we hope soon to make a contract for: copies of all those contracts, if deemed necessary, will also be furnished.

In addition to this, the company have had a large force employed, the greater part of the summer, in widening the present canal from Richmond to Chevallie's mill; which, from the nature of the work, it was found impracticable to let out by contract. This has been found to be a very difficult undertaking; and though the greatest obstacles have been overcome, yet much remains to be done. They have been able to let out that part between Chevallie's mill, and the new locks of Briggs & Gamble; and much work has been done on it by the undertaker.

The contract of Briggs & Gamble has not yet been completed. The locks, however, are nearly finished, as also the canal; but, as the navigation must be stopped for a short time, in order to take up the old locks, and make the communication with their canal, which cannot conveniently be done until the next season, we will have the advantage of testing the security of their canal, by keeping water in it during the winter, before it is taken into actual use.

They will take the liberty, by a supplemental report, to call the attention of the Board of Public Works, and through them that of the legislature, to the subject of their finances; a subject all important, not only as to the completion of the works, and the fulfilment of the contracts now made, but as to the future progress of the great improvements contemplated. This subject requires more time and deliberation than they can, at this moment, bestow upon it. They may, also, add some matters, as to the actual state of the improvements, which may now have escaped them, or which may be found necessary in consequence of further reports from their agents on the Kanawha river and road, now daily expected.

They will, also, particularly call your attention to the subject of the origination of a board of president and directors better adapted than the present to the proper direction of the important improvements committed to the James River company, and which seems absolutely necessary to insure their success.

On behalf of the board,

JNO. COALTER, *President.*

(A true copy,)

ROBERT POLLARD, *Clerk.*

Report of the state of the James River Company, for the half year ending June 30th, 1822.

Capital subscribed,		£42,000, or $140,000 00
Aggregate of requisitions made on the stockholders? For the whole amount.		
Amount paid by stockholders? The whole amount subscribed.		
Amount due by individual stockholders?		
Amount due by the Board of Public Works?		
Capital expended in the work? Not only the capital subscribed, but a very large sum beside, which can be ascertained if required.		
Tolls received from the 1st January to the 30th June last? (See statement of receipts and expenditures,)		12,240 83
Sums expended out of the tolls in repairs and improvements, for the same time,		84 00
Officers' salaries, and expenses of collecting tolls? (See statement of expenditures for same time,)		1,887 50
Other expenses.		
Dividend for the half year,		8,400 00
Balance of money in hand:		
In the Bank of Virginia,	$452 89	
In the hands of the treasurer,	654 72	
		1,107 61
Amount of debts due by the company,		12,599 85
Amount of debts due to the company,		728 12

ROBERT POLLARD, *Treasurer.*

State of the Loans obtained by the James River Company.

DR.

1822.				
Jan.	1—	To balance in the bank of Virginia,	$21,720 30	
		In the Farmers' bank of Virginia,	7,200 00	$28,920 30
	7—	To Mutual Assurance Society against fire, &c.		5,000 00
May	21—	To the bank of Virginia,		50,000 00
June	4—	To Catharine Gamble,		5,000 00
	14—	To ditto,		1,000 00
				$89,920 30

CR.

1822.				
Feb.	2—1	By Briggs & Gamble,		$1,200 00
	8—2	By John Caruthers,		5,000 00
	22—3	By ditto,		5,000 00
	25—4	By John Dolton,		2,000 00
March	8—5	By John Caruthers,		3,000 00
	12—6	By ditto,		7,000 00
April	9—7	By Thomas Lee,		245 37
	"—8	By James Knox,		668 30
	22—9	By John G. Gamble,		625 00
May	6-10	By Briggs & Gamble,		2,000 00
June	12-11	By ditto,		2,000 00
	30—	By balance, viz:		
		In the bank of Virginia,	$51,520 30	
		In the Farmers' bank of Virginia,	9,661 33	61,181 63
				$89,920 30

Summary of the James River Company's cash account, for the half year ending June 30th, 1822.

DR.

To balance on hand on 1st January, 1822, viz :		
In bank of Virginia,	$ 16,597 07	
In the hands of the treasurer,	1,415 92	
		$ 18,012 99
Received for tolls,	12,240 83	
" From John Staples,	2,121 25	
" For rent of water and ground,	2,490 00	
		16,852 08
		$ 34,865 07

CR.

By William Piggott,	$ 431 25	
John Brown,	200 00	
John Coalter,	500 00	
Thomas Rutherfoord,	350 00	
Charles Copland,	350 00	
Hezekiah Mosby,	1,000 00	
Robert Pollard,	500 00	
Edward Cunningham,	350 00	
		$ 3,681 25
Charges,	47 50	
Expenses improving the bed of James river,	36 50	
		84 00
Dividends,		10,872 00
Interest,		1,838 35
Advanced out of the ordinary funds on account of the fund on account of loans,		17,281 86
Balance in the bank of Virginia,	$ 452 89	
In the treasurer's hands,	654 72	
		1,107 61
		$ 34,865 07

ROBERT POLLARD, *Treasurer.*

State of the loans obtained by the James River Company.

DR.

1820.				
Aug.	29—To	president and directors of Literary Fund, at 6 pr. ct.		$ 50,000 00
1821.				
July,	9—To	Needler Robinson, at 5½ pr. ct.		3,300 00
Aug.	31—To	John Gray,		5,000 00
Sep.	24—To	Catharine Hays,	"	4,000 00
"	"	To Sloe Hays,	"	4,000 00
Nov.	14—To	Catharine Gamble,	"	4,000 00
1822.				
January	7—To	Mutual Assurance Society, against fire in the State of Virginia,		5,000 00
May	21—To	Bank of Virginia, at 6 pr. ct.		50,000 00
June	4—To	Catharine Gamble,	"	5,000 00
"	14—To	ditto ditto,	"	1,000 00
				$ 131,300 00

CR.

1822.				
June	30—By	expenditures for the improvements on James river to this date,		$ 41,506 95
"	"	By ditto on the Kanawha road,		21,625 60
"	"	By ditto on the improvements on the Kanawha river,		6,985 82
				$ 70,118 37
"	"	Balance in the Bank of Virginia,	$ 51,520 30	
"	"	Balance in the Farmers' Bank of Virginia,	9,661 33	
				61,181, 63
				$ 131,300 00

ROBERT POLLARD, *Treasurer.*

Expenditures of the James River Company, for the half year ending June 30th, 1822.

Officers' salaries, viz:		
The president and directors, allowed in January,		$ 1,900 00
*Other officers,		1,887 50
Charges,	$ 47 50	
Expenses improving the bed of James river,	36 50	
		84 00
		$ 3,871 50
Dividends due 1st July, 1822,	$ 8,400 00	
Interest on loans,	1,548 84	
		10,948 84
		$ 14.820 34

Receipts, viz:		
For tolls,	$ 12,240 83	
" rent of water,	281 25	
		$ 12,522 08
The receipts for the half year are short,		2,298 26
		$ 14,820 34

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*Hezekiah Mosby, toll-gatherer,	$ 1,000 00
Robert Pollard, clerk and treasurer,	500 00
William Piggott, keeper of the upper locks, and for assistants,	287 50
John Brown, keeper of the lower locks,	100 00
	$ 1,887 50

Officers' salaries, employed by the James river company, on account of the new improvements, to 30th June, 1222.

John G. Gamble, engineer, on the James river, at $2,500 per annum,	$ 2,430 56	
John Staples, assistant do. do. do. $ 1,200,	340 00	
Moncure Robinson, leveller, &c. on do.	562 17	
		$ 3,332 73
John Bosher, do. on the Kanawha river, at $ 1,200,		1,387 50
William Anderson, superintendent of the Kanawha road, $ 1,000. Commenced about 15th June, about		41 66
		$ 4,761 89

◆

State of the James River Company's accounts for the half year ending June 30th, 1822.

DR.

To amount of debts due by the company, exclusive of the interest on loans,	$ 10,051 01
Dividends due 1st July, 1822,	8,400 00
Balance,	266 58
	$ 18,717 59

Interest due to sundries, June 30th,	$ 2,548 84

CR.

By amount of debts due to the company,		$ 728 12
Cash in the Bank of Virginia,	$ 452 89	
In the hands of the treasurer,	654 72	
		1,107 61
Due from the fund on account of loans for advances out of the ordinary funds,		16,881 86
		$ 18,717 59

Balance per contra,	$ 266 58
Balance to be repaid by the surplus fund,	2,282 26
	$ 2,548 84

ROBERT POLLARD, *Treasurer.*

RICHMOND, December 7th, 1822.

BERNARD PEYTON, Esq. Secretary to the Board of Public Works.

SIR,

The vacancy occasioned by the resignation of Dr. John Adams of the situation of president, preventing the Richmond dock company, at this time, from making their annual report to the president and directors of the Board of Public Works, through the usual organ of communication, the treasurer is advised that it devolves upon him to become the medium.

Fully apprised of the importance of advancing their works to a state of productive operation, as quickly as was consistent with their undoubted safety, for the uses to which they are intended, the views of the company have been directed, since their last annual report, as well to the completion of such works as were necessary to render practicable the admission of vessels, as to strengthening and securing in a manner to satisfy the apprehensions of the most timid, all such parts of the works of former years as, in the exercise of the most cautious judgment, they deemed obnoxious to danger or injury.

A brief sketch of the labours of the past year, will comprehend a new flood-gate put up at the upper end of Haxall's canal; a jettee of stone built near Haxall's mills, for the protection of the canal bank from that place to Mayo's bridge: the completion of the waste opposite Shockoe creek, and which is found to meet all the expectations that were formed of it; the puddling, raising and widening of the embankment from 23rd street, to the upper end of the great lock, which embankment now constitutes at the same time, a safe and lasting dam, and a spacious street; the filling in of the chambers and around the lock with good clay; the excavation to a sufficient depth of the channel, from the lock to deep water, near Young's upper wharf; the cutting off to a proper depth, the piles which for the security of the great lock, had been driven along the whole extent of both its fronts, and the hanging of the gates of the great lock, &c.

The execution of some of these subjects, presented difficulties, requiring the exercise of a good deal of ingenuity and perseverance to meet and surmount them. To cut off the piles in front of the lower end of the chamber of the great lock, at the depth of 12 feet below the surface of the water, was after various attempts found impracticable, without the use of a diving bell: one was procured to be cast on the most approved plan, which fully answered the end for which it was intended, and was found very useful, also in hanging the large gates of the lock; and it is believed it will prove a valuable acquisition in facilitating any improvements that may be hereafter undertaken of the navigation of the river below.

In conclusion; the company have the satisfaction of informing the president and directors of the Board of Public Works, through you, that having kept the basins and canal full of water during nearly the whole of the past year, experience has banished all apprehensions of the ability of the works, to receive and retain whatever water it may be necessary to introduce into them; and that the great lock is so nearly completed that they believe they may safely and confidently say they will be able, in a few days, to admit vessels of nine feet draught of water into the full use and benefit of their works.

The annual tabular return is as complete as it can now be made, and, together with the foregoing, is respectfully submitted.

H. BAKER, *Treasurer*
Of the Richmond Dock Company.]

Return of the state of the Richmond Dock Company on the 1st day of December, 1822.

Aggregate of requisitions made on the stock holders,	$ 250,000 00
Amount paid by stockholders,	243,323 75
Capital subscribed,	250,000 00
Amount due by individual stockholders, and note C.	6,677 05
Amount due by the Board of Public Works?	Nothing.
Capital expended in the work? See note A.	
Tolls received? Nothing, the works not having yet been in operation.	
Officers' salaries, and expenses of collecting tolls, in detail: Superintendent $ 1,200, clerk and treasurer $ 500, overseer $ 500 per annum,	2,200 00
All other expenses, and for what? See note A.	
Dividend declared, and when? None.	
Balance of money on hand? None.	
Debts due by the company, $ 38,456 38, and see note B.	
Debts due to the company, otherwise than on account of stock, $ 616 43.	

Note A. The amount paid in by the stockholders, added to the amount of debts due from the company, making together $ 281,780 13, would seem to be the amount of capital expended in the work; but, disbursements have been made, and debts contracted, which, owing to the recent necessary absence from town, for several weeks, of the chairman of the superintending committee, have not yet been reported and audited. The *exact* cost of the works, up to this period, cannot, therefore, be now given; and owing to all the expenses of, and incident to the work, having been amalgamated in a general account of charges, no specification can be given, at this time, of "all other expenses and for what." It is hoped, however, that the omission will be the less material, as it is contemplated to prepare an expose of the whole cost of the works, up to the period of their going into operation, detailing therein, as well the character, as the amount of the different items of expenditure.

Note B. That this is not the whole amount of debt due from the company, and the reason why, is explained in note A.

Note C. Of this, the sum of $ 5,628 37, is the subject of suits, one in the superior court of chancery for the Richmond district, the other in chancery in the Richmond hustings court. The sum of $ 175, is suspended for examination, and may terminate in a suit; and the sum of $ 873 68, is due from insolvent stockholders, whose shares have been sold. In effect, however, the company are no losers by the last mentioned sum, as they became re-possessed of the stock, and it formed part of that subscribed for by the Board of Public Works.

E. E.

H. BAKER, *Treasurer*
Of the Richmond Dock Company.

OFFICE OF THE SWIFT-RUN GAP TURNPIKE COMPANY, *Fredericksburg*, 4*th December*, 1822.

BERNARD PEYTON, Esq.
Secretary to the Board of Public Works.

SIR,

I enclose the return of the Swift-Run Gap turnpike company.

Your's, respectfully,
WILLIAM ALLEN,
Secretary and Treasurer.

Return of the Swift-Run Gap Turnpike Company on the 4th day of December, 1822.

Capital subscribed by individuals,	$ 49,700 00
By the commonwealth of Virginia,	4,100 00
By the Board of Public Works,	46,000 00
	$ 119,800 00
Aggregate of requisitions made: whole amount of subscription,	$ 69,700 00
Amount paid by stockholders,	$ 68,245 69
Amount due by individual stockholders,	$ 1,454 31
Amount due by the Board of Public Works,	$ 11,500 00
Capital expended on the road,	$ 120.637 99
Tolls received from 20th December, 1813, to 1st December, 1822,	$ 28,930 91
Sum expended out of the tolls, in repairs and improvements,	$ 2,506 30
Officers' salaries, and expenses of collecting tolls; secretary and treasurer, salary from 1816 to 1822, both inclusive, 7 years, at $ 133 34-100,	$ 933 38
One gate-keeper, for same time, at $ 200 per year,	1,400 00
Two do. do. at $ 150 each do.	2,100 00
	$ 4,433 38
All other expenses? None.	
Dividends declared, and when? From January, 1816. to July, 1822,	$ 22,205 00
Balance of money on hand? None!!!	
Debts due by the company, to sundry persons for the surplus of their stock, which was sold for the instalments,	$ 292 23

Negro hire for the present year,		684 75
To Virginia Bank, for money borrowed,	$ 12,500 00	
This sum over-checked,	104 94	
		$ 12,604 94
		$ 13,581 92

Debts due to the company, otherwise than on account of stock—Advanced discounts for a company which subscribed for stock, and borrowed money from bank to pay for it, $ 843 46.

WILLIAM ALLEN, *Secretary and Treasurer.*

LEESBURG, 2d December, 1822.

To BERNARD PEYTON, Esq. Secretary
to the Board of Public Works.

SIR,

Enclosed you receive the report of the Leesburg turnpike road company, made out pursuant to a plan you enclosed me some time ago. I hope that the board will authorise you to pay me one-half, at least, of the last instalment due by the state.

I am, very respectfully, sir, your obedient servant,

THOMAS R. MOTT, *Treasurer,*

Of the Leesburg Turnpike Road Company.

Return of the state of the Leesburg Turnpike Road Company on the 1st day of December, 1822.

Capital stock subscribed by individuals and the state,		$ 84,000 00
Aggregate of requisitions made on individual stockholders,		$ 50,400 00
Amount due by individual stockholders,		$ 9,625 92
Amount paid by individual stockholders,		$ 40,774 08
Amount due by the Board of Public Works,		$ 8,400 00
Capital expended in the work? The whole, after the debts (are paid) now due by the company.		
Tolls received from the 11th December, 1820, to 1st July, 1822,		$ 5,474 80
Sums expended, out of the tolls, in repairs and improvements, viz:		
Expended in repairing road,	$ 428 00	
Ditto in rebuilding Goose creek bridge,	1,986 96	
		$ 2,414 96
Officers' salaries, and expenses of collecting tolls, viz:		
Salary to president, per annum,	$ 100 00	
Do. " 4 directors, at $ 25 each, do.	100 00	
Do. " 2 toll-gatherers, at $ 150 each, do.	300 00	
Treasurer's commission,	108 12	
		$ 608 12

Dividends declared, and when?

A dividend of the profits, from the 11th December, 1820, to 1st of July, 1822, was made on the 1st of July, which gave 4 per cent., for that period, on all sums then paid up, and proportionably on all sums paid up after that period, which gave to the stockholders about 2¾ per centum per annum, and consumed of the profits, $ 1,374 08.

Balance of money on hand, $ 96 52.

Debts due by the company, to Leesburg Bank,	$ 6,700 00
To Enoch Francis, $ 2,000; for making road, $ 11,122 24,	13,122 24
	$ 19,822 24
All other expenses, and for what?	
Interest on debts due by the company,	$ 915 08
Other small items, expenses of surveying clerks, printers' fees, &c. &c.	162 56
	$ 1,077 64

Debts due to the company, otherwise than on account of stock? None.

THOMAS R. MOTT,
Treasurer of the Leesburg Turnpike Road Company.

OFFICE OF THE POTOWMAC COMPANY,
George-Town, D. C. 2nd December, 1822.

SIR,

In conformity with the order of the Board of Public Works of the 8th of February last, I have the honor on behalf of the president and directors of the Potowmac company, to transmit you herewith, a report of the affairs of the company in the form prescribed.

With great respect, I am, sir,

Your very obedient humble servant,

J. MASON.

*To BERNARD PEYTON, Esq. Secretary
of the Board of Public Works of the
State of Virginia, at Richmond.*

Return of the Potowmac Canal Company, on the 1st day of August, 1822.

Capital subscribed,	Aggregate of requisitions made on stockholders,	Amount paid by stockholders,	Amount due by individual stockholders,	Amount due by the Board of Public Works,	Capital expended in the work,	Tolls received from the 1st day of August, 1821, to 1st day of August, 1822,	Sums expended out of the tolls in repairs and improvements, officers' salaries, and all other expenses,	Officers' salaries and expenses of collecting tolls, per annum.	Total sum expended,	Dividend declared 2d August, 1802,	Cash on hand,	Debts due by the company,	Debts due to the company, otherwise than on account of stock.
$355,111 11	$355,111 11	$336,551 10 *A.*	$932 20		$336,551 10 *B.*	$11,103 50	216,949 60	2,111 77	729,387 29	3,890 *C.*	1,088 07	175,886 59	15,126 *D.*

A. The difference between the "amount *paid* by the stockholders," and the "aggregate of requisitions made on the stockholders," is accounted for by the loss on U. States 6 per cent. stock, taken at par from the state of Maryland for its subscription of 130 shares, at 130*l.* sterling each, in 1799, of	$ 5,551 18
By the balance unpaid by original subscribers, on 30 *shares* which *have reverted* to the Potowmac company by sale of their respective interests under the incorporating act, amounting to	12,076 63
And by balance yet due by individual stockholders of	932 20
	$ 18,560 01

B. By "capital expended in the work," is here meant original stock. The "total sum expended," including toll-money and loans, as well as capital stock, was, as will be seen, much larger.

C. This is the only dividend that ever has been paid from the toll-money; all the rest having been applied, as it accrued, to the works and other purposes of the company.

D. $ 15,000 of this is due from the Shenandoah company.

NOTE.—There are yet several debts due to, and from a lottery concern in which the company was engaged some years ago; as it depends on the fate of the debts due on this account, it is yet uncertain how this concern will settle.

J. MOORE, Jr. *Treasurer*
Potowmac company.

To the Board of Public Works for the State of Virginia.

GENTLEMEN,

The Board of Public Works having requested that all companies with whom they have any connection, should make a report of their condition and transactions more in detail than has been done heretofore, we proceed, cheerfully, to comply with their request, so far as we are able. We think a particular statement of the affairs, and progress of the several companies, is not only necessary for the government to exercise a salutary control over them, but that it will form a history of the several works, from which, hereafter, many useful lessons may be drawn.

The Upper Appomattox company being formed before the Board of Public Works, the report of our engineer, pointing out what was requisite to be done, so as to render Appomattox navigable from the upper country to tide water, was never returned to your office. It may still be proper therefore to make some return of this nature. But at this period, we suppose it will be a more satisfactory and useful performance of this duty to describe the works that have been accomplished by the company, than to return a copy of our engineer's report. And although it may be tedious and entirely uninteresting to most people, it may afford some information to him who is enquiring how such works may be executed, and what in this country will be their probable expense. We shall therefore attempt a description of them.

It was judged that the bed of Appomattox could be rendered navigable until it reached within about 5½ miles of tide water. This has been executed so as to answer for the present. Here a stone dam has been placed across the river, and a canal formed on the south side, taking a supply of water from the river 112 feet above tide water. This first level of the canal extends three miles 1083 yards to Old town creek, where there are four locks by which the boats descend thirty three feet to the second level of the canal which is carried over Old town creek on a stone aqueduct 42 feet above the water in the creek, and continues on one mile 709 yards, to the Basin at the public warehouse in Petersburg, making the length of the canal from the river to the basin, five miles thirty-two yards.

Allowing three feet for the descent of the canal, the water in the basin will be seventy-six feet above tide water; and at present descends over three stone wastes, and passes into the river.

The canal was designed to be sixteen feet wide at bottom, in the narrowest parts; about twenty-eight feet on the water line, and three feet depth of water. The labour bestowed on the bed of the river, has been considerable. It answers a valuable purpose, and the river is now used one hundred and ten miles above Petersburg. But it is designed, as soon as funds can be obtained for that purpose, to make further improvements on the bed of the river.

For a particular description of the more difficult works on the Appomattox canal, and the manner in which they have been executed, we refer you to the enclosed paper marked A.

We beg leave to remark, that we have reason to believe the capital employed would have fallen very far short of executing the work, nor would it have been as well executed, had we not adopted the custom of the country in obtaining and directing labor. We began our operations by purchasing what we judged a requisite number of laborers, including a blacksmith; employed a good stone mason, under whom, we placed a number of such as we judged best qualified to learn the trade. The labour of the rest of the hands was directed by as industrious, and enterprising an overseer as we could obtain. The necessary provisions for the year were purchased every fall. To this add the purchase of iron, steel, powder and coal, together with the annual wages of a clerk; and we have all the principal items of the annual contracts, or expenses of the company. This arrangement gave very little room or temptation to speculate on the company.

The same laborers being continued, they became expert, and were qualified to execute the most difficult parts of the work, in the best manner.

The enclosed paper marked B, exhibits the amount of toll for the last year, and the articles on which it has been paid.

The paper marked C, gives you the state of our funds, and how they have been applied, together with the answer to various enquiries made of us.

The public warehouse is not sufficiently large to store one-fifth of the tobacco sent down the river. This compels the owners of tobacco to have it drayed to other houses in town, where storage can be obtained. Were the house sufficiently large, the public convenience would be promoted; the keeper of the warehouse would find more employment, and the expense of a keeper might be more easily defrayed. The commonwealth own land joining the basin, on which their warehouse might be enlarged to any extent that may be requisite.

We desire very much to know how we shall act so as to render this company worthy of public patronage.

Promoting the particular interest of the company does not limit our view of the subject. Should we be able with the aid usually afforded by government, to show that individuals may vest their capital in works of this kind with profit, it would immediately awaken a spirit of enterprise. There are in this part of the state capital and industry. The local situation of the country invites us to enterprises, which promise wealth and reputation to the age that shall accomplish them. But we yet want that knowledge and confidence, which can only be obtained by experience. We want a little of the sunshine of public favor to set us in motion.

Your obd't servants,
RICHD. N. VENABLE,
THOS. A. MORTON.

December 2d, 1822.

[C.]

Return of the state of the upper Appomattox Canal Company, on the 1st of September, 1822.

Property of the company and debts due them, (viz:)		
Debts due,	$ 12,455 00	
Off for bad debts during the whole transactions of the company, say,	2,000 00	
		$ 10,455 00
Cash on hand,		690 00
Land for which has been paid,		2,126 50
Nine old negro men, say,		1,000 00
		$ 14,271 50

Amount of debts due from the company,			$ 15,428 44
Amount of stock subscribed,	622 shares		
Off for 11 shares purchased in by the company,	11		
	611 shares at $ 100		$ 61,100 00
			$ 76,528 44
Amount of toll received from 1st September, 1801, to 1st September, 1822,		$ 24,887 84	
The whole amount of rents due and received,		5,373 33	
		$ 30,261 17	
Expenses of improving the bed of the river, say,	$ 10,000 00		
Expense of clerk, toll-gatherer, lock keeper, repairs of banks, and other expenses for the last ten years, at $ 1,000 per annum,	10,000 00		
		$ 20,000 00	
			$ 10,261 17
			$ 86,789 61
Off debts and property on hand, as above,			14,271 50
Amount of the cost of the canal, and works about Petersburg,			$ 72,518 11

REPORT

OF THE

JOINT COMMISSIONERS,

ON THE

POTOWMAC RIVER,

WITH SUNDRY DOCUMENTS.

RICHMOND:
Printed by Thomas Ritchie, printer for the Commonwealth.
1823.

COUNCIL CHAMBER, 15th January, 1823.

SIR,

In compliance with a resolution of the House of Delegates of the 6th inst. requesting a communication to the House, of all the information in possession of the executive, concerning the duties and services performed by the commissioners appointed on the part of this state, and of the state of Maryland, to examine into, and report on the state of the navigation of the Potowmac river, &c.; I have now the honor to lay before the House, copies of the report of the joint commissioners to this department; also, of sundry documents accompanying the same, which contain all the information on the subject, in the possession of the executive.

I have the honor to be,

With great respect,

Your obedient servant,

JAMES PLEASANTS, Jr.

The honorable the Speaker
of the House of Delegates.

To his Excellency,
The Governor of Virginia.

The commissioners, in submitting their report, deem it necessary, in justice to themselves, to state the reasons why the fulfilment of their important duties has been thus long delayed. Measures were taken to commence the survey as soon as the subsiding of the spring freshes would permit, but owing to the distance at which the commissioners lived from each other, and to the circumstance, that Mr. Moore, the late engineer of Virginia, was, at that time, engaged in a survey of the Roanoke, we did not assemble at Cumberland until the 15th of July last. The inspection of the river from that point to the mouth of Savage, and the survey of the line of connection between the western and eastern waters, occupied us until about the 31st of July, upon which day we commenced locating the canal. From that period we were most sedulously engaged; and although several of our party were attacked with sickness shortly after leaving Cumberland, we still persevered, and, through many difficulties, on the 18th September, reached a point of the river 157 miles below the beginning.

Here, nearly the whole party, commissioners as well as others, were prostrated by disease, which rendered our further progress impracticable. Mr. Moore had hitherto preserved his health, and we parted with him under the expectation that we should meet on the 4th of November. Soon, alas! we were distressed by hearing of his death; an event which has deprived the world of a most valuable man, remarkable for the scope of his intellect, the practical soundness of his views, and his devotion to pursuits which are becoming more and more important to our young and rising country.

Deprived thus of the necessary services of Mr. Moore, and several of our number still being confined by sickness, no meeting took place at the appointed time, and it was not until about the first of December that we again assembled. In the interim, the Board of Public Works for Virginia, with a discernment which did them honour, appointed Mr. Isaac Briggs the successor of Mr. Moore in his duties upon the Potowmac.

The advanced season of the year, and the inclemency of the weather, would probably have deterred us from finishing the survey, but the cheerful alacrity of Mr. Briggs encouraged and sustained us, and, under his auspices, we have happily completed our labour.

Deeply impressed with a zeal for the internal improvement of our respective states, we regard it as a duty, at the same time that we feel it a pleasure, to recommend Mr. Isaac Briggs to their consideration. Few, if any, can be found equal to him in those most useful branches of science to which he has devoted himself; in practice he is prompt and skilful, and in calculation his rapidity is like intuition, while his accuracy defies scrutiny.

Considering how very little the important science of civil engineering is understood in our country, we do not hesitate to say, that a man so thoroughly versed, will be invaluable to that state which may have the discernment to perceive his merits, and the liberality to appropriate his services.

With great respect, we are,

WM. NAYLOR,
MOS. T. HUNTER,
ATHANS. FENWICK.

REPORT, &c.

To his Excellency,
The Governor of Virginia.

The commissioners appointed by the law of Virginia, and the resolutions of Maryland, of the year 1821, jointly to examine the affairs of the Potowmac company; the state of the navigation of the river Potowmac; its susceptibility of improvement; and to make report whether the said company had complied with the terms of its charter, granted by the two states, and its ability to comply within a reasonable time; and whether any, and what aid, should be given to the said company, and what would be the best means of effecting an improvement in the navigation of the said river, report:

That, in compliance with the injunctions of the two states, they did assemble in Georgetown on the 2d day of July last, and commenced the discharge of their duties, by examining the affairs of the Potowmac company: And it appears the company have not only expended the whole of the dividing stock, but have incurred heavy debts, which their present resources can never enable them to discharge. Nor is it reasonable to expect, in such circumstances, that they can ever effect the objects of their incorporation. A distinct statement of the accounts, debts, receipts, and expenditures of the said company, is hereto annexed, marked (A.)

The provisions and special conditions of the charter, and laws of the two states, then occupied their attention, previous to the examination of the works, which had been executed under the direction, and at the expense of this company, on the river. From the best consideration, which they could give the subject, it appears to the commissioners, that the Potowmac company have failed to comply with the terms and conditions of the acts of their incorporation. An abstract of the charter, and the laws relative to that subject, are herewith presented, marked (B.)

It will be thus seen, that the right to take tolls, and all other privileges were granted them, on condition that the navigation of the river should be completed within a given specified time, which has been variously extended by subsequent laws, and finally expired under the Maryland law on the 1st January, 1813, and under that of Virginia, on the 1st of January, 1820; that the navigation required to be effected, was such as should "render the river well capable of being navigated, in dry seasons, by vessels drawing one foot water;" that, upon an application by the Potowmac company to the legislature of Virginia, in 1802, for an exposition of the words, "dry seasons," that the legislature declared, that those words, "as used in the charter, were to be intended and understood, all seasons:" An interpretation, of which the correctness cannot be well questioned. From an actual measurement of the depth of the river by the commissioners, it was ascertained, that at the time of their examination of it, there was not a sufficient depth of water for the navigation of boats drawing even six inches. It is true, that at their session of 1802, the Maryland legislature passed a law, founded upon the idea that the Potowmac company had accomplished the object of their incorporation, confirming to that company all the rights and privileges conditionally granted in the charter. But, it is extremely apparent, that to absolve from an obligation, requires equal or paramount power to that which imposed it; and, of course, neither Virginia nor Maryland could singly release a condition which the Potowmac company had bound themselves, to both, to perform. The act of the Maryland legislature can, therefore, only be considered as nugatory; and, indeed, that legislature itself seems so to have considered it; for, in the year 1809, seven years after the passage of the confirmatory act, it passed another law, extending to that company the time of completing the navigation of the river. The commissioners, upon full consultation, do not deem it prudent, or expedient, to give further aid to the Potowmac company. The only alternative, therefore, that remains, is to divest them of their charter, and adopt some more effectual mode of improving the navigation of the river. Nor can this procedure be regarded as harsh, when duly considered. The law, and justice of it, it is presumed, have been made manifest. Will it be an injury to the stockholders? Look at the exposition of their affairs, marked (C,) furnished by the company itself: See the annual amount of their tolls: and, in the present defective state of their navigation, which they have no means of improving, can it ever be increased? Deduct from it the expense of repairs, and contingencies; as salaries to clerks and toll-gatherers; and then compare it with the amount of their debts, or even the annual interest of their debts; and, visionary, indeed, must be that man, who can expect ever to draw a cent of profit from such stocks. With such resources, can such debts be redeemed? The fact is, the Potowmac company are precisely in the situation of all other chartered companies who fail in their undertakings; their expected profits have eventuated in loss and disappointment.

It is due, however, to that company to state, that although errors under which they labored in the principles and practice of improvements in navigation have been great, and have caused a useless expenditure of large sums; still they acted with the best lights heretofore possessed by the best informed persons in our states. They have not only expended the whole of their original stock in attempts to improve the river; but nearly all their tolls, with the exception of their necessary annual expenses, having been appropriated to the same purpose. And their failure to accomplish the objects of their incorporation, may be fairly attributed to a want of information on the subject, at the very early period of our existence as a nation, when that company was formed.

The journal of notes made by the commissioners, of the condition of the navigation and depth of water, taken from day to day, as they descended the river, is hereto annexed, marked (D,) from which it will be seen that the river to Goose creek, which has been ascertained to be 157 miles long, is in no section of ten miles at all navigable in low water by loaded boats of any kind or dimensions; and for more than eighty miles, obstructions from shallows, sufficient to stop a skiff, are to be met with on an average division of that distance every half mile.

THE PRESENT STATE OF THE NAVIGATION.

It has been stated, and is believed by many persons, that the river Potowmac, in its present condition, is navigable nearly half the year. The Potowmac company are required to give a low water navigation, of a foot deep, throughout the year. This circumstance, and the idea entertained of the possibility of confining the waters in the bed of the river, to narrow sluices, have confirmed this opinion. The commissioners have given a minute examination to this branch of the duties imposed upon them, and satisfied themselves, from their own observations, and the most careful enquiries, that no such blessing is enjoyed by the fertile districts, through which the river flows.

The floods and freshets give the only navigation at present used. They occur usually from the first of September, to the 20th of June; variously however in various years, and it so happens that although boats are known in some years to pass down through each of the months intervening between these dates; yet, in consequence of the ice during winter, and the short continuance of a flood giving navigable water, the average duration of the boating time in a course of many years, does not much, if at all, exceed eight or ten days passable water, for full-loaded boats late in the year, and from 25 to 30 days in the spring of the year; making the whole time when produce and goods can be stream-borne in the course of one entire common year, from thirty-three to forty-five days. The duration of this period necessarily increases as you approach the Great Falls, and decreases as you ascend to the head of the river. The evils attending the present state of navigation, lessen the benefits which might be supposed to be derived from even this short period. They chiefly consist in its uncertainty, and dependence on the vicissitudes of the seasons, in the great rapidity of the current of the river, in consequence of the great fall or inclination of its plane in proportion to its length, in its dangerous character arising from the wildness of the torrent, and the suddenness of its curves and meanders, having worn its devious way, in the lapse of ages, through countless ridges of rocks and mountains: And, in consequence of huge fragments of rocks, and large loose stones, the remains of the wasted mountains, scattered thickly, and in some places rising over the entire bed of the river, and leaving no passage for loaded boats impelled by the rapid and impetuous current, but what may be found by warping and winding, with the utmost exertion of strength, agility and watchfulness, on the part of the crew, through a most irregular course. By these dangers, many boats and cargoes are destroyed. The uncertainty and the shortness of the duration of the floods are the very worst features in the character of this navigation. This uncertainty frequently occasions the most ruinous disappointments to the farmers, millers, and merchants. The expected rains are often denied; and the consequence frequently is, that contracts cannot be complied with, without loss and ruin. Sometimes a small rise, and deceitful appearances, induce a collection of the scattered crews of the boatmen from the mountains, and a general shipment of produce. By the time they have descended 40 or 50 miles down the river, a fall in the water takes place; the boats are compelled to stop; and then storage, increased expenses, neglect of agents, and natural causes, waste the profits, or damage the produce of all concerned. This chiefly occurs in the upper part of the river. Sometimes the rains come on sooner than they are expected, and the rise and fall in the river succeed each other before the farmers are prepared to make their shipments: then the crops lie on hand till the next year, subject to all the inconveniences and losses accompanying such circumstances; and when the floods are most propitious, and the navigation is best under existing circumstances, the usual consequence is, that the produce of immense districts of country, among the most fertile in the union, is all forced into market at one time; and a capital which might be sufficient to give better prices, if the merchant had time to receive the proceeds of one investment, before he made a second, is found inadequate to give a fair price to all under such disadvantages. Thus, the farmer has frequently no alternative left, but to sacrifice the fruits of his year's labor. The expenses are already too great, and produce will bear no additional cost, or risk of shipping farther; and to carry it home again, is impossible; for, sometimes even the boat which brought it down, cannot be floated back empty. It is surely to be lamented, that, wretched as is this navigation, it is the sole dependence of a vast country, which in spite of its fertility, and the value of its inexhaustible minerals of the most useful kind, is most evidently drooping and suffering for want of a ready market for its productions; without which stimulus, it is impossible for its agriculture to flourish, or its natural resources to be developed.

Bad indeed as is the navigation above described, still this conveyance is preferred by all who can avail themselves of it, to land carriage. With all its uncertainties and risks, it is found cheaper by all the farmers and millers, than maintaining supernumerary horses, throughout the year, for the purpose of carrying produce to market. If additional proof were required, a stronger cannot be adduced, than this very circumstance of the immense superiority of navigation, over land carriage. If navigation encumbered with so many risks and uncertainties, and unavoidable expenses, is still preferred by all who can avail themselves of it, to the usual land carriage, assisted by improved roads to all the sea-ports; and if this, the worst and dearest of all kinds of navigation, does yet give an increased value to the lands contiguous to it, over those whose sole reliance is the turnpikes, what may we not reasonably calculate, will be the still further increased value of the lands, afforded by a safe and constant still water navigation?

SLUICE NAVIGATION.

As what has been called sluice navigation, has been the kind adopted by the Potowmac company, and the one on which so large a part of their funds has been expended, it may be necessary to give an explanation drawn from actual observation, of what has been done and tried for many years of this kind of work on the Potowmac.

The sluices on this river are of three kinds. The first, which are chiefly found in the upper part of the river, are channels formed by low walls. The second, are channels formed by excavating the rocky bottom of the river. The third kind, which are yet used, and have been of service to the navigation in high water, are channels opened near the banks of the river around the rapids, and small falls in the current, as at Harper's Ferry, Payne's falls &c., to avoid the great force of the torrent in mid stream in such situations, and with a view of giving the boatmen a land path on the bank on which by a rope they drag the boat up the stream, when the violence of the current is too great to be overcome by setting poles. These channels, though used, are of very imperfect, and temporary construction, the bottoms of no one of them being graduated. They are certainly too imperfect to be called canals, although such is their common appellation. The two first of these kinds of sluices, are formed on erroneous principles, and have failed to render any service to the navigation of the river. The errors in the first, requiring detail, will be presently explained.

The errors in the second kind, or in navigating channels in the bottom of the stream, consist in attempting on a long line of stream, inclining all the way in its whole length, to regulate the depth by partial cutting or deepening the bottom. Unless you bring water to a level, the whole length of the line of its stream, any partial cutting or deepening in spots along the line inclined, only serves to transpose a shallow a little further up the line, or to make hollow basins of no service; and in a river where the chief failure in its navigation, arises from the too long and too frequent deficiency of depth of water, necessary for boating, owing to the great inclination of the plane of its stream, and to its consequent rapid discharge of water, if you smooth the plane by removing all obstructions, the rapidity will of course be increased, and the sooner will the deficiency in the depth be felt.

The low dam or walling plan of improvements, though the opposite in its effects to the one described, and not radically erroneous on general principles, is no less so in its application to such a river as the Potowmac. To make this manifest, some detail of the circumstances in which they are used and placed is necessary. The ruins of this kind of work, are to be seen some distance above Cumberland, but do not, however, reach to Savage river, and extend at greater or less intervals to where the general depth of water is considerably increased, becoming more and more rare as the water is more abundant. They consist in low dams running across, from shore to shore, elevated about 18 inches or two feet from the bottom, and made of rounded stones picked up out of the bed of the river, of the size that a man can conveniently handle, the greater part not larger than a man's head, and raised on a broad basis of from ten to twenty feet in width. This transverse low wall or dam is usually connected with two walls about the same height, but built on a narrower basis of from six to eight feet placed parallel to each other, and to the shores at the distance of 20 feet from each other; through which passage by a gap in the transverse dam, it is intended to force the current of the river, and to deepen the water by collecting it into this artificial channel.

The number of these transverse walls connected, as stated with 20 feet sluices on the river, is very great, but it was not thought necessary to correct them. Indeed, in such a state of ruin were the greater part of them found, that they were difficult to be distinguished from the numerous fish dams found along the whole course of the river. A few, but enough of them, were in a sufficient state of preservation, to be examined, and to afford the means of ascertaining how far they were calculated to answer the ends intended.

The commissioners are not prepared to say, what might be the effect of this kind of walling on other rivers: but they are well assured, that the river Potowmac cannot be usefully confined, by such contrivances, even if they were made in the best manner, of which that kind of walling is susceptible. The bottom of this river, which forms the drain of a mountainous region of such wide extent, is very unequal in its level, and abounds in shallows and basins according to its obduracy or softness, and to the increased or diminished force of the current, sometimes weakened by expanding in widening plains, or in the formation of islands; sometimes increased by contraction between mountains and rocky banks, and above all, by its flowing so rapidly in consequence of the greatness of *its depth* compared to its length. The result from such circumstances on this kind of work, situated in the bed of such a river, is, that these walls cannot be made sufficiently permanent; and if they could, so very many of them would be required, to attain even a trifling depth, that the benefit would be infinitely too dear, or an absolute waste of money. These walls, from their nature, cannot be tight; but if they could be made so, and the whole body of the water in such a river could be confined to a channel of 20 feet, the velocity of the current rushing through these short channels, with full room to spread after it has passed, would be increased in proportion to its confinement. And the whole volume of water in the river, in the summer and dry seasons, especially above the south branch, would not be sufficient to give the depth required by boats of sufficient size to be useful in transportation, where the quantity of water in this river is much increased by the large tributaries in order to give 18 inches depth, and less would be of no use. It would be necessary to continue the parallel walls, much further than they have ever yet been attempted, so as to give them a length sufficient to reach over the whole extent of continued shallows, which were found in places to cover 3 or 4 miles. The effect of lengthening the sluice walls, would be in some measure to lessen the velocity, and of course to increase the depth of the current; but the evils are much too great to be usefully remedied by the small effects which could be produced by these means, if it were practicable to give duration to walls, so built and so placed. Walls of this kind, when drawn so long, and winding and bending as would be necessary to follow the course of the current, would be objectionable for other reasons independent of the increased liability to destruction, such as the extreme difficulty of guiding a boat with sufficient accuracy in these narrow confined torrents, so as to prevent her striking and bilging against or over the side walls in descending,* and the fact that in ascending them, her progress would be so much retarded, by the increased force of the current consequent on its confinement. For, on the supposition of a large proportion of the distance being so confined, many wrecks would be added to the length of time, consumed in a trip to and from market, already inconveniently long, and in some places capsons would be required to be placed on the banks, to overcome the opposing power of the current. For these reasons, and from the experience already had of the perishable nature and trifling utility of this sort of work, it appears that it would be idle to attempt any thing in future of this kind.

* NOTE.—The greater part of the wrecks which of late years have occurred, according to information received along the river, were in consequence of the boats being dashed against the sluice walls.

LOCK AND DAM NAVIGATION.

Another mode is by some relied upon, to improve the navigation of this river, in consequence of its supposed greater cheapness than a canal, properly so called, and consists in deepening the water in the bed of the river, sufficient for the purposes of navigation, by high dams of large stone, and solid construction, with a lock or two locks to each dam, and a short canal for the purpose of descending and ascending each level.

This mode has many and great inconveniences inseparable from it. The most important objection to it, is the greater expensiveness of the kind of navigation which it alone affords; that is, in boats managed by men, instead of boats drawn by a horse. Besides this general objection, many reasons may be adduced to shew, why it cannot be advantageously adopted on Potowmac river. The general width of this river, is too great. The fall is also too considerable: And the alluvial margins, which alternate from the right, to the left bank of the river, the whole length of its course to tide water, and which vary in elevation, form 15 to 30 feet, would in high water, without enormous expense, form insecure abutments to the dams. This kind of margin being formed of loose earth, of comparative recent formation, would, when obstructions are placed in the bed of the river, be liable to be forced and washed away, at the extremities of the dams. The dams themselves, although ever so solidly built, would require frequent repairs. The fall in the river from Cumberland to tide water, being about 537 feet, would require about 58 dams, as the banks would not admit of a greater elevation being given to the dams, than 10 feet, without great risk of damaging the marginal property, and of increasing the liability to frequent injuries to the dams themselves,* each dam, would require a lock of the same lift as the dam; and also an entering canal with a guard lock of considerable elevation, to be used in high water. Add to these the dangers of being thrown by the current over the dams, however judiciously located below the guard lock, and the inconveniences which would arise in high water. Taking all these disadvantageous circumstances into the account, consider the number of dams, locks, &c. and their great length from 100 to 800 yards, and the necessary solidity required in their construction, and then calculate the other incidental expenses; the whole amount would be nearly equal to the cost of a regular canal, and the advantages would be infinitely less. Upon a full view of the different plans, therefore, it cannot for a moment be doubted, but that the adoption of a regular canal out of the river, though following its ravine, will be the most useful and durable improvement, and when the advantages and cost of each mode are relatively considered, incomparably the cheapest.

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* Lock and dam, is the kind of navigation, adopted on the Schuylkill river; but that is a small narrow river, with high banks, and much damage it is said has been done to marginal property in consequence of the dams.

The canal, which under all circumstances, the commissioners have thought best calculated to suit the localities of Potowmac river, on which our estimates are founded, is one 30 feet wide at top, 20 feet at bottom, and 3 feet deep, the earth to be thrown out next to the river, to form a tow-path elevated two feet or thereabouts, above the level of the water in the canal, and the tract of the tow-path to be 10 feet wide: The level of the canal to be generally elevated above the highest floods except when it is found necessary to take in a supply of water from the river, or to pass expensive ground along a rocky shore. Thirty feet, it is supposed, is the necessary width to admit the passage of two boats of sufficient size to carry 25 tons, and to admit of a small platform in the bow of the boat, sufficient to take a horse in upon *the same plan*, as that in two places would be necessary, where it has been found expedient to cross the river by means of a dam, to avoid too expensive cutting or walling.

In order to ascertain the practicability and cost of this plan, the commissioners have had the assistance of the late engineer of the state of Virginia, on whose sound practical judgment and knowledge entire reliance may be placed, more especially, after the test his estimates have undergone on that part of James river, where part of the canal he had designed, has been completed.* And it has been there found, that contractors and undertakers, in sufficient numbers, can be obtained from various parts of the United States, to undertake the works, at the estimated cost, whenever the states think proper to authorise the cutting of a canal. The report and calculations on this plan, made from Mr. Moore's field notes, by Mr. Isaac Briggs, who has been appointed his successor, as far as we proceeded before the adjournment, occasioned by the serious sickness of the greater part of the commissioners, and of the engineer and surveyors, that is, about half a mile below Goose creek, are herewith presented, and shew the utmost probable cost of such a canal for that distance.

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* Mr. Briggs, the present engineer, was himself a contractor for the cutting of a part of the James river canal, which has been completed, and can experimentally attest their correctness.

Plats of the courses of the river and canal, will likewise accompany the plan and calculations, and all be hereto annexed.

The commissioners have endeavoured in their examination of the manner and cost of improving this river, to take as complete a view of the subject as circumstances would permit; so as to present to the legislature, such a representation as would enable them, without losing sight of the ulterior advantages which must grow out of a canal so located, and out of the consequent future ramifications and extension of which it will necessarily be the parent, as to be able to shew not only the entire cost of the undertaking, as far as the national road at Cumberland, but the cost of so much as may now appear within the limits of the ways and means of the two states. With this view, they directed the engineer in his outset, to make his calculations of the surveyed route in sections, so as to shew the whole cost of each section, from one important point to another, along its whole course. This they supposed would place the commencement of this great work completely within the reach of the resources of the states; as, whether the canal commenced for the present at Cumberland, and descended the river where the greatest obstructions to navigation are found, as far as Williamsport; or at tide water, and ascended the river, every section when completed, would add to the value of the commerce and soil of the states, and therefrom something would at once be received in tolls. The level and survey of the whole course being once ascertained and decided, any part of the work, likely to afford the greatest benefit and profit, might be completed in such a manner as to be united with the remainder, without addition of cost or any derangement of the plan. This partial cutting in sections would enable the states to keep their expenditures within reasonable bounds, and to guard against the necessity of oppressive burthens: At the same time, that they would lay the foundation of an improvement, which when extended across the mountains, and completed, it is no vain boast to say, will be of greater importance, than any other of which the topography of the United States is susceptible.

The territorial feature of the United States, which is most important to all our relations, political, commercial and social, is the extensive range of mountainous regions which divides the rivers falling into the Mississippi, from those which fall into the Atlantic ocean. It forms a wall of separation between the west and east, and the difficulties it presents has diverted the western commerce from the nearest seaport, and caused its general current to seek distant outlets around its southern and northern extremities. Such, however, is the wise arrangement of Providence, that when the evils resulting from this great barrier, operate most severely, that is, nearest to its centre, it has placed the remedy within our reach. Of all the rivers which reciprocally drain the lands beyond, and on this side the mountains, the Ohio on the one side, and the Potowmac on the other, extend their ramifications, of which any use can be made, nearest to each other, and nearest to the summit level of the dividing ridge. Such, also, is the favorable shape of the mountains at this point, where these waters approach nearest, that its flattened surface forms extensive and luxuriant meadows, called glades. A well known operation of the laws of nature at this elevated point, at all times many degrees cooler than the surrounding air, condenses the vapours, and attracts the clouds rising on either side of the mountains, so that these elevated plains or glades, in the driest season, are copiously supplied with water, and afford rich and abundant pasturage, when all the vallies below them are parched with drought. Deep creek is a western stream falling into Youghagany, which forms in these glades, and is situated at the point from which the commissioners commenced their measurement, within 204 feet of the summit of the dividing ridge, and can be brought by a cut within two miles of a branch of Savage river, called Crabtree run, at the junction of its branches at Swan's old mill on this side of the mountains. Deep creek is a copious stream, with banks nearly perpendicular, running through the soft earth of the glades, and was, in the season when they examined it, (supposed to be the driest which has occurred within the memory of most men living,) from three to four feet deep, and from 9 to 12 feet wide, with a current of about one and a half miles to the hour. There is a narrow pass* in a ridge of the glades, through which Deep creek makes its way, where, by erecting a dam 15 or 20 feet high, and not more than 40 or 50 yards long, these meadows may be inundated, and an immense pond may be formed, equal, at least, to 3 or 4 miles in length, and half a mile in breadth. This reservoir, it is believed, would furnish sufficient water for locks, and a canal, if carried through the dividing ridge by a tunnel two miles long, to descend and ascend both sides of the mountain to the Monongahela on the west, and to Savage river on the east, especiallly when recruited as you de-

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* Called Hoop-pole ridge.

[illegible] by Big Youghiogeny on the west side, and by Crab tree run on the east side respectively. The last was not examined, but from the position of the sources of Little Youghiogeny, it is believed they might be easily conveyed into the same reservoir.*

Sufficient attention has not heretofore been paid to the invaluable supply of water afforded at this elevated point, by the principles of attraction and condensation. Wherever mountains have a sufficient surface, near or at their summits, of any extent, sufficient to prevent the rapid waste of water which steeps occasion, they generally possess all the qualities of the best meadow land. Mr. Gallatin, in his masterly report on the roads and canals of the United States, has entirely overlooked the consequences of this operation of natural causes at this point: and asserts from the supposed absence of such a reservoir, the impracticability of uniting the western and eastern waters. His words are these. "The impracticability arises from the principle of lock navigation, which in order to effect the ascent, requires a greater supply of water in proportion to the height to be ascended, whilst the supply of water becomes less in the same proportion. Nor does, (says he) the chain of mountains through the whole extent, where it divides the Atlantic from the Western rivers, afford a single pond, lake or natural reservoir." In this assertion, happily for posterity, this eminent statesman is substantially mistaken, and it is highly satisfactory to know that this grand desideratum can be found, and that whenever the resources of the nation are deemed sufficient to undertake the magnificent labor of perforating the great barrier of the east and west by the short tunnel required, water will not be found wanting for canaling purposes. The want of the necessary supply of water is the main consideration, and next, whether the objects to be attained are worth the expenditure required. Mr. Gallatin, in another part of this report, justly remarks: "Nor should the plan, on account of its magnitude, be thought chimerical; for, the elevation and other natural obstacles of intervening ground, or want of a sufficient supply of water, and not distance, are the only insuperable impediments to an artificial navigation."*

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* These glades, and this slowly gliding stream, were, to us, surprising objects, elevated as they are, and situated among the spurs or lateral ribs of the Little Back-bone mountains, which have but a small rise above these natural meadows, and exhibited to the eye, fatigued with the severity and rudeness of the face of nature, in the tedious ascent to these elevated plains, an appearance no less delightful than unexpected, of an open level country, clothed with flowers and rich verdure, intersected with gently rising hillocks, crowned with trees not thick or impervious to th nor continued along the combs of these low hills, but de clumps presenting the pleasing delusion of an improve namented country.

The route for a canal from Cumberland to the Monongahela, across the mountains, and its practicability, are so intimately connected with the canal at present contemplated, that it necessarily blends itself with every view of the subject. It was for this reason that the work was commenced at Deep creek, the better to judge of its practicability, and of the reasonableness of the consequences expected to arise from opening the canal navigation, as far as now recommended. The section across the mountains to the states of Virginia and Maryland, would at present undoubtedly be an undertaking beyond their ordinary means. But to the states of Ohio, Kentucky, Pennsylvania, Virginia, and Maryland, who are all immediately concerned, it might not prove so, and certainly not to the United States, who are no less deeply interested in its accomplishment, upon political considerations involving our dearest interests of internal strength and security in war, of commerce and revenue, and the preservation of the union. Of its practicability, it is believed little doubt can exist, as

*NOTE.—The following extract from Mr. Hamilton Fulton's report to the Board of Public Works of North Carolina for the year 1821, page 22, will give an idea of the operation of locks on canals, and of a new method of *saving the waste of water*, so precious at great elevations, by means of basins or ponds arranged in a particular manner, where many locks are necessary to surmount considerable elevations. Mr. H. Fulton is an engineer of celebrity, induced by North Carolina to come to this country from England.—Extract: "Although I do not approve of more locks than one being built at one place, yet the work, &c. double, treble, quadruple, &c. chains of locks cause much attention and waste of water, as the following examples will show; viz: If a boat has entered the upper lock for the purpose of descending, no other boat can ascend, until she has got out of the lower lock, and vice versa. If a boat ascends immediately, after one has descended, as many lockfulls of water must be drawn from the summit, as there are locks in the chain, and if a descending boat succeeds the ascending boat, the whole of the water is lost except one lockfull: thus an ascending and descending boat in a chain of six locks, will draw off six lockfulls of water from the summit, while an ascending and descending boat passing through six single locks, *with ponds of sufficient capacity* between each, wil draw off only *one lockfull* from the summit."

the necessary supply of water can be found. The cost of the lockage and tunnel are the only real obstacles. When the practicability of a line of canal is ascertained, where a doubt can at all exist as to the relative preponderance, it is the province of prudence, previous to the adoption of an expensive plan of improvement, to weigh in the scale of contemplation, the costs and labor against the advantages expected to be derived therefrom. The cost of the section of a canal from Cumberland to Monongahela, although it will, whenever the estimate is made, be found comparatively much greater than on lower levels; yet, will fall far short of what an inexperienced public have heretofore imagined. But on the other hand, who will undertake to enumerate the advantages and growing profits on the trade of the only canal, which is practicable between the waters of the Ohio and the Chesapeake? It is only necessary to see the unequal location of the central route, the length of the barrier of mountains which it would sever, the boundless regions of the north-western states and territories, and the extent, literally unparalleled on the globe, of the already connected inland navigation, by means of the great lakes and colossal rivers to be united with the Potowmac, and to consider the greater distance and expense of getting to and from their markets on our sea-board, to be entirely satisfied, that in a country increasing in population, wealth, and the knowledge of political economy like ours, the object to be attained in a pecuniary point of view alone, is beyond calculation; and it affords the most ample guarantee for the interest and capital that may be invested to complete it, whatever may be the amount of such investment, and cannot fail moreover to be a vast and always increasing source of revenue hereafter, either to the states through which it will pass, or to the United States, whichever may undertake it. The paramount and primordial claim of this route to public attention is evinced by the location of the national road, and also, of the seat of government, and no less so by the early date of the charter of the Potowmac company, immediately after the peace establishing our independence. This last circumstance shews it to have been the very first object of this nature, which engrossed the attention of Virginia and Maryland, when we had scarcely drawn the first breath of emancipation. The manuscript calculations of our Washington, who was the father of this company, shew, that in his mind the western trade and the improvement of the Potowmac, were always intimately connected. He makes the difference between the routes from Detroit on Lake Erie, by way of Fort Pitt, now Pittsburg, and Fort Cumberland to Alexandria, and that to New York in distance 496 miles, or upwards of 500 miles to tide water in favor of the former.* This grand speculation of this great man, of drawing the commerce of the lakes and their north-western territories to Alexandria, requires only the union of the waters of the Ohio and Potowmac, in order to be realized: And with daily increasing experience, and a full sense of the rapid advance in the value of the great prize, it cannot fail ere long to be begun and completed.

It is supposed, that when the nature of a voyage from the states north of the Ohio to New-Orleans, or to New-York, is contrasted with a voyage to Washington, on Potowmac, on the supposition of the navigation being perfected across the mountains, that, in many respects, the advantages will be so considerable in favor of Washington, that it will, in most instances, be preferred. This preference over New-Orleans will arise from the down stream navigation of the rivers emptying into the Ohio; in the gentle current of the Ohio, compared with the rapid stream of the Mississippi, taking into view the time, labor, and expense of returning, as well as going to market, on each route; the effect of the climate of New Orleans in damaging flour and bacon, and all vegetable and animal productions, and its dangerous influence on more northern constitutions, as also the very great difficulty and length of time it requires for ships to get up from sea to that city. Over New-York, the advantages will consist in the shorter distance, and the necessity of navigating the lakes in vessels of a different construction from those used in rivers and on canals, requiring a change of hands, navigators, and the repeated removal of cargo from the one kind to the other, while the owner of a boat will be able to go and come all the way to Washington, in most instances, with a crew of his own neighborhood. Add to these reasons, the circumstance of the

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*Manuscript calculation of general Washington from Detroit, by the route through Fort Pitt and Cumberland, to Alexandria:

To Alexandria, - - - -	607
Richmond, - - - -	840
Philadelphia, - - - -	741
Albany, - - - -	943
New-York, - - - -	1,103

New York canal being closed one month longer by ice every year, than a canal on Potowmac; and the superiority of this route will be manifest.*

GENERAL ADVANTAGES OF CANAL, OR STILL WATER NAVIGATION.

On a canal, such as is now proposed, a boat carrying 25 tons burthen, will be enabled to go up the river course, with the same facility she goes down. The navigation on the canal will be always good, except when it is closed by ice. The present condition of the navigation of Potowmac river has been explained; and the difference in these important respects is too glaring to require additional comment.

The usual load of a waggon, on our turnpikes, is stated at 3 tons; a boat, one man, a boy, and a horse, will be equal for transportation then, to more than 8 waggons, 8 men, and 40 horses, each travelling at the same rate of distance in equal time. A calculation is hereto annexed, marked (Z,) which shews that, taking into view the daily expense, interest on outfit, and wear of the waggon, men, and horses, required to transport 25 tons; and the same expenses, interest, and wear of a boat, man, boy and horse, required to bear the same burden

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* NOTE.—The comparison of the distance and difficulties now existing between New-York and Washington, on the route from Pittsburg to both, is stated as follows:

Pittsburg to Brownsville, by stream,	60 miles.
Brownsville to Cumberland, turnpike,	72
Cumberland to Georgetown, by stream,	188
	320
Pittsburg, up the Alleghany, to Waterford,	160
Portage to French creek,	14
French creek to the canal, by the lake,	90
Down the canal, and Hudson, to New York,	520
	784
	320
Difference in favor of Washington,	464

There is 58 miles less portage to New York; but, to balance this, there is 100 miles more up stream, and 90 miles more lake navigation.

on a canal, the transportation by land carriage is 20 times greater than by canal. It may well then be stated, "that the public would be great gainers, were they to lay out upon the making of every mile of canal, twenty times as much as they expended upon a mile of turnpike road; while a mile of canal is often made at less expense than a mile of road;" though commonly it has cost, on recent work in this country, something more per mile; this excess has rarely exceeded a third of the cost of a mile of turnpike, locks, culverts, &c. all considered. To shew how the tolls may be increased, for the benefit of a canal company, while the freight is still lessened very considerably, an example given by the late Mr. Robert Fulton is so strongly stated, and clearly illustrated, that we cannot do better than insert it, verbatim:

"By the Lancaster turnpike, from Philadelphia to the Susquehannah, at Columbia, is 74 miles. On it, from Columbia to Philadelphia, a barrel of flour, say 200 weight, pays one dollar carriage. A broad-wheeled waggon carries 30 barrels, or 3 tons, and pays for turnpike, 3 dollars: thus, for each ton carried, the turnpike company receives only one dollar. The making of the road cost $ 444,000; or, on an average of $ 6,000 a mile. I will now suppose a canal to have been cut from Philadelphia to Columbia, and, with its windings, to make 100 miles, at $ 15,000 a mile; or, for the whole, $ 1,500,000. On such a canal, one man, one boy and horse, would convey 25 tons 20 miles a day; on which, the following would be the expenses; a man, $ 1; a horse, $ 1; a boy, 50 cents; tolls for repairing canal, $ 1; tolls for passing locks, &c. $ 1 50; interest on the wear of a boat, 50 cents; sum total, $ 5: this equal to 20 cents a ton for 20 miles; and no more than $ 1 a ton for 100 miles, instead of $ 10, paid by the road: Consequently, for each ton carried from Columbia to Philadelphia, on the canal, the company might take a toll of *six dollars* instead of *one*, which is now got by the road; and then the flour would arrive at Philadelphia for *seven dollars* a ton, instead of *ten*, which it now pays. The ton of merchandize, taken from Philadelphia back to Columbia, would also pay $ 3 less than it now pays. Suppose that exactly the same number of tons would move on the canal that are now transported by the road: Again; let it be supposed that at one dollar a ton, the turnpike company gains 5 per cent. per annum on their capital of $ 444,000, or $ 22,200; consequently, 22,200 tons must be carried; which, at *six dollars a ton* to the canal company, would give $ 133,200 a year, or 8¾ per cent. for the capital of $ 1,500,000."

In order to see the immediate effect of cutting a canal from tide-water to Cumberland, it is necessary to ascertain the amount of tolls now taken on the roads leading from and through those districts of country which will avail themselves of the cheaper conveyance, by canals, as from Leesburg to Alexandria, and Georgetown, and from Uniontown by Hagerstown, Boonsborough, Fredericktown, &c. to Baltimore and Georgetown. The tolls now taken on these roads, and also at the Great Falls of Potowmac may be 5 or 6 times increased in amount on the canal; and still, in consequence of the great saving in freight, as above stated and exemplified, the cost of transportation to the owner of the produce, or goods, will be greatly cheaper than it now is by the road."

But by far the greater part of the toll received on canals generally, and likewise on this canal, will accrue on those articles, which are too bulky to be transported to any considerable distance by roads or the present navigation. The use of these necessary, although cheap articles, is now almost wholly denied to a large inland population, and the benefits of such as the interior affords, excluded from the seaboard. Among these are fuel, the materials for building, and certain articles of food and domestic use:

To wit: coals, cordwood and charcoal, lime, slate, marble, iron, timber, potter's earth and tanner's bark, indian corn, oats, barley, salt, beef, pork, cyder, fruit, tar, turpentine, &c.

The supply of these articles, to be obtained from the banks of Potowmac and its branches, is literally inexhaustible, for which there will be a growing demand.

The chief articles at present exchanged by the interior with the seaboard, are flour, hemp, flax, wool, bacon, lard, whiskey, tobacco, ginseng, tallow, beeswax, pearl ash, live cattle, hogs and horses.

The productions, for which will be created a market altogether new, and those of the seaboard and of commerce, for which the demand will increase, in consequence of opening a canal, are, plaister of paris, salt, fish oil, fish, all the other productions of the rivers, and every kind of foreign merchandize.

The fisheries on the rivers, emptying into the Chesapeake, will be doubled in value; the coasting trade of the Chesapeake will be increased; ship building will be promoted; and, in fine, the states will feel the beneficial effects of such an improvement in every quarter and extremity of their territory.

The article of coal which is found in such profusion, in the vicinity of the north branch of Potowmac, of a quality equal to the best Liverpool coal, in the event of the completion the canal, may be afforded in Georgetown, at 20 cents, king full allowance for freight and tolls at the same rates, as paid by grain and more valuable articles; and if on such cheap bulky articles of the first necessity, the freight and tolls are rateably lowered, as would be politic and reasonable, the price may be thus ascertained: Supposing a ton or 2240 lbs. to pay 1 cent freight and 1 cent toll per mile, and where the pits are 8 or 10 miles removed from navigation, as the case of those near Cumberland, and the coals have to be carried that distance to the canal in waggons, the price will be

For waggoning 1 bushel 10 miles,	6 cents.
Price and digging 1 bushel,	2
Freight for 190 miles,	6
Tolls for same distance,	6
	20

But, supposing the tolls and freight on articles of this kind, reduced 1-3d as may well be done with a view to extend the market, the price might be stated at 16 cents.

The price of coal has varied of late in the sea ports, from 25 to 37½ cents, per bushel. In Europe, the existence of abundant coal mines is supposed alone sufficient inducement for cutting a canal, so many are the uses, and so immense is the consumption of this article, when it can be obtained on moderate terms. Fuel enters so largely into the price of every article manufactured, that on its cheapness depends, in a measure, the success of numerous establishments, which, at first view, seem to have no connection with it; and in all articles wrought by fire and steam, it is the principal ingredient of price. In our country, even the productions of agriculture will be increased by a reduction in the price of coal. The whole of the wood reserved for fuel in the rich vallies along the Potowmac, and its branches would be cleared, and the land brought into cultivation. Nor would the beneficial effect end here, but would be felt throughout the borders of the Chesapeake. Slate banks of an excellent quality for roofing, are found in still greater abundance than coal and more of them immediately on the banks of the river: so that if facilities for transportation were carried to the quarries which might be opened, slate for roofing could, it is believed, be furnished as cheap as the best shingles.

The immense banks of iron ore, which are yet unopened along the river, on account of the limited demand, would, if iron could be transported more cheaply, and the price of fuel was considerably reduced, be another resource added to the wealth of the states, and afford considerable tonnage to the canal. The lime which is now furnished in our sea-ports, and which principally supplies the demand for this most useful article in architecture and agriculture, is brought from Rhode Island. This would afford a new source of industry and profit to our citizens, now engrossed by our more active neighbours.

Such will be the creation of new resources of wealth and population, and such are some of the prominent benefits, to be derived from this canal. Within the last 60 years, England has quadrupled her wealth, and political importance; and this rise in her fortunes dates with the operation of her canals, commenced within that period. Holland, the Netherlands, the valley of Lombardy and China, are yet more striking instances of the immense increase of the power and population of territories in consequence chiefly of canals. When we look at the advantages of the now contemplated canal, its immediate operation on the value of the lands of the South Branch and Shenandoah, and the whole valley of Potowmac, cannot fail to strike the intelligent observer. The mountainous counties of Hampshire and Alleghany will, in consequence of the value and abundance of their minerals, become the most important counties in either state, and the points on which the lever will rest, that is, to advance and extend the manufactures, commerce and agriculture, of the most distant ramifications of the Chesapeake. Cumberland will become the entrepot of the merchandize of the west, and at no distant date, a thoroughfare for the greatest commerce in the union. Baltimore being already established, and possessing enterprize and capital, will have it in her power to enjoy the largest share of these new created fountains of wealth. Nothing will be wanting to ensure this, but to add a short link to the great internal trade by a canal from Bladensburg, or the head of the eastern branch of Potowmac, to the Patapsco at Elkridge. The distance between these two points, in a straight line, cannot exceed 18 miles, and the route of a canal would not be probably more than 25 miles. The elevation on this route above the tide is not great, and the upper part of the Patapsco, and other important streams, there is reason to believe, furnish the supply of water required for the highest level. If this is the case, and there is little doubt of it, the cost of this work would not be great. Or, if it should accord more with the wishes and interest of the citizens of Baltimore, to branch the canal at a higher point on the Potowmac, let provision be made for trying the practicability of a canal, from the foot of the Catocton mountain, or any point below it, to Baltimore.

PROBABLE PROFITS OF THIS CANAL.

Taking the average tonnage of the loads which have passed through the locks in the years 1819-20 and 21, from the official documents furnished by the Potowmac company, it is 11,815 tons each year. Supposing ten barrels of flour to each ton, the amount which has descended the river each year, is a quantity of produce equal to 118,000 barrels of flour.

If such is the quantity transported on the river in its present imperfect state of navigation, it is not extravagant to suppose that four barrels of flour are now carried by land, for one which is transported by water, and which, when the canal is completed, will seek that cheaper conveyance: this would make an additional amount of 472,000 bbls. The inhabitants of the counties of Hardy, Pendleton, and Bedford, in Pennsylvania, are exclusively devoted to grazing: if the facilities of transportation were afforded them by a canal, they would either slaughter their cattle at home, and send down the beef and pork, or would turn their attention to the more profitable pursuits of agriculture. From these counties, we may fairly calculate upon the addition of 300,000 barrels. The establishment of a canal will, without doubt, draw commerce from the counties of Franklin, in Pennsylvania, and Shenandoah, Rockingham, and a large part of Augusta, in Virginia, for which we may confidently add 250,000 barrels. From respectable authority, we learn that in the year 1821, 400,000 barrels of flour were made in the four south-western counties of Pennsylvania, all of which would seek a market by way of the national road, and contemplated canal. Add to this, 150,000 barrels from the state of Ohio, and the counties of Ohio, Brooke, Preston, Harrison, &c. in Virginia, and the aggregate amount is 1,600,000 barrels.

The toll now established on the Potowmac, is 22 cents per barrel for the longer distance, and 11 cents for the shortest; the medium may then be stated at 15 cents. The tolls, then, upon 1,600,000 barrels would amount to the sum of 240,000 dollars; the estimated cost of the canal, say is, 1,578,954 dollars, upon which, the sum of $ 240,000 gives 15 per cent. per annum profit, and an excess sufficient for annual expenses.

In this calculation, the tolls on the ascending commerce, consisting of plaister of parish, salt, fish in barrels, and foreign merchandize required for the interior, is not enumerated; they, it is supposed, will amount to a third of the sum of the descending toll. Nor is any allowance made for the tolls in the new articles, which will be added to the descending trade, viz: coal, lime, timber, Indian corn, &c. So that if any doubt can exist concerning the increase of tolls in the proportion above stated, these additional sources of tonnage will insure the profit of 15 per cent. per annum. But there is a yet stronger assurance of gaining at least this amount of profit, when it is considered how much this rate of toll assumed may be increased, and still leave the freight considerably cheaper than it now is, as is so clearly apparent from Mr. Fulton's statement already cited.

WAYS AND MEANS.

From Cumberland to tide water, is 185 miles; the cost of a canal for 182 miles of that distance is ascertained to be, $ 1,578,954; for the remaining 3 miles, the canal at the Little falls when enlarged may be used. This sum divided between the two states, will give $789,477 to be furnished by each. It is proposed that the money should be raised by a loan for 16 or 20 years, which could probably be effected at 4 per cent. per annum; but, for the greater certainty, let it be calculated at 6 per cent. As soon as the loan shall be determined upon, let books be opened under the direction of the states, for the subscription of stock, by individuals at such places, as the legislature shall deem expedient; each individual to be entitled to the stock he subscribes for, upon condition of his paying annually to the state, the interest on the amount, until the annual profits of the canal shall be adequate to an extinguishment of a part of the loan, and a discharge of the annual interest. Of whatever portion of the stock that shall not be subscribed for by individuals, the states themselves shall be considered as holders. The probable nett profits of the canal, when completed, upon a moderate and sober calculation, have already been estimated at 15 per cent. upon the whole capital required to construct it. Whenever the canal shall be finished, let these profits be exclusively appropriated to the payment of the interest and redemption of the loan. And even should these profits yield only ten instead of 15 per cent., they would be amply sufficient to liquidate the whole debt in less than 16 years; so that in order to accomplish this important object, each state would only have to pay for 5 years, within which time it is supposed the canal might be finished, the interest on 789,477 dollars, or on so much thereof, as shall remain after deducting the amount of individual subscription.* But should it be deemed by the legislature inexpedient to raise so large a sum by loan, it is submitted to their wisdom, in order to test the accuracy of the above scheme, whether it would not be an object of great public utility, to make those sections of the canal between Harper's ferry and tide water, and whether it would be a measure forbidden by suggestions of the strictest prudence to borrow a sum sufficient for their completion. The amount required, would be 560,127 dollars. But take this sum and divide it between the states. Let the foregoing plan be adopted ; and then the payment of the interest for 2 years, within which period the canal could certainly be effected, on $ 280,063, or so much of that sum, as should not be taken by individual subscription, would be the only burthen to the states; or in fact, only half the interest for the first year, as it would be only necessary to borrow money according to the annual expenditure.

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* NOTE—So that a subscriber say for 100 dollars, would in the event of the completion of the canal, within 5 years as cal-

It is probable that local jealousies, which are so natural to the mass of mankind, and which have, since the first dawn of civilization, been found in array and opposition to all the internal improvements of nations, and to canals, the greatest of all others, will, on this occasion, have to be combatted. These arise from the supposed effect canals have to injure existing markets, by increasing rivals, and of lessening the value of the productions of those portions of territories already enjoying the exclusive benefit of those markets. These jealousies have, however, in every country where canals have been introduced, been proved, by experience, to be ill founded ; for, so great is the dependence of each part on the condition of the rest, and so intimate is the general connection in a nation, that even the favored few, so far from being injured, have been benefitted by the general prosperity. Population, commerce, and consumption, have invariably kept pace with the increase of productions. And, the uniform consequences have been, a general increase of power, wealth, and civilization.

ELIE WILLIAMS,
ATHANS. FENWICK,
WM. NAYLOR,
MOS. T. HUNTER,
W. T. T. MASON.

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culated, and of its yielding a per centum sufficient to discharge the interest and principal on $ 1,500,000 in 16 years, has to advance in all only $ 30, and then would be entitled to hold 100 dollars in stock ; and in any event, the subscriber could never be called on for more than six dollars per annum.

[Z.]

The amount of toll on a ton of merchandize being stated at one per cent. per mile, and the freight also at one per cent. per mile, and 8 men, 8 waggons, and 40 horses, being the number required to transport the burthen of one boat, drawn by one horse, and managed by a man and a boy, viz: 25 tons: assume then equal rates of expense as the basis of calculation. Say, for example, they each proceed one hundred miles, the waggon by land, and the boat by canal, and each travel 20 miles a day, carrying 25 tons of goods. The expense of one waggon per day is: for one man, one dollar; for 5 horses, five dollars: that is, $6 00

The expenses then of 8 waggons, 8 men, and 40 horses, is per day,	48 00
The boat at the same rates, is for one man, $ 1, one boy, 50 cents, and a horse, $ 1, each day,	2 50
It requires 5 days, at the rate of travelling assumed to perform a trip of 100 miles.	
5 times the daily expense of the waggons is,	240 00
5 times the daily expense of the boat is,	12 50
The difference in the cost of freight of 25 tons, by land or water, free from toll, is,	$ 227 50
Next add the interest on the outfit for land carriage, and the same for the boat, &c.	
A waggon cost, when new, say, $ 100.	
Then 8 waggons cost $ 800, and 40 horses, each $ 100, amount together to,	$ 4,800 00
The gear of 5 horses, when new, say cost $ 50; and 40 horses, therefore, is,	400 00
	$ 5,200 00
A boat 70 feet long, 10 feet wide, say will cost $ 150, and the horse and gear, $ 110; that is for canal outfit,	260 00
Difference,	$ 4,940 00

The annual interest on 4,940 dollars at 6 per cent. is $ 296 40. A waggon it is supposed cannot last in service on the road more than 8 years without repairs. Then the rate of the wear of a waggon may be stated per annum at one eighth of the cost.

For repairs of each waggon per annum,	$ 12 50
Horses in constant use in heavy draught, it is supposed, cannot be fit for service more than 5 years on an average; then one fifth of the cost is the allowance for loss of horses. This for 5 years is equal to	100 00
A horse in service, will require a new set of shoes every two months,	
This for 5 horses, make the wear of shoes,	30 00

The gear of 5 horses is worth new $ 50, and will last on an average say 5 years; then we may add for this item of wear per annum for each $ 10; at these rates calculate the difference.

The interest on the outfit of 8 waggons and 40 horses, after deducting the cost of the boat and horses,	$ 296 40
Wear of 8 waggons each $ 12 50,	100 00
Wear of 40 horses as above,	800 00
Shoes of 40 horses as above,	240 00
Wear of gear, as above,	80 00
	$ 1,516 40

The cost of the boat and horse, having been deducted from the sum on which interest is taken, no interest is therefore charged here.

A boat will surely last longer than a waggon in service; but we will state it at the same, that is, eight years; then take one-eighth of $ 150, the first cost of the wear of a boat per annum,	$ 18 75	
Wear of one horse,	20 00	
Shoes for one horse, as above,	6 00	
Wear of gear as above,	2 00	
		$ 46 75
Difference in wear and interest in one year,		$ 1,469 65

To understand this difference more exactly, let the expenses per day for 5 days as above, on each kind of transportation, be added to a proportion of the sum of the annual wear and interest, equal to 5 days.

Expenses of 8 waggons, &c. per day,	$240 00
1,516 dollars and 40 cents, divided by 73, gives the wear, interest, &c. for 5 days, viz :	20 77
Entire expenses of waggons per day,	$ 260 77
Same expense for same time of the boat, &c. is	$ 12 50
$ 46 75, divided by 73, is	64
Entire expense of boat, &c. per day,	$ 13 14

The sums total of the expense of each mode divided by each other, viz: $ 260 77 by 13 14, shews that the expenses of land carriage may be stated in round numbers, at 20 times the cost of transportation by water; besides changing the employment of the supernumerary carriers in extensive districts of country, from the unproductive to the productive classes of citizens.

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GEORGETOWN, D. C. July 5th, 1822.

General John Mason, President
Potowmac company,

SIR,

As joint commissioners appointed by the states of Maryland and Virginia, to report the situation and condition of the affairs of the Potowmac company, the amount and character of the debts due by the said company, and its receipts and expenditures; we respectfully request your attention to the subjoined subjects of enquiry, and ask that you will do us the fovour to answer them, so far as your archives may enable you, and as speedily as your convenience will permit.

We remain, most respectfully, yours,

Signed, ELIE WILLIAMS,
ATHANS. FENWICK,
WM. NAYLOR,
WM. T. T. MASON,
MOSES T. HUNTER.

1st. The number of shares of the capital, or dividing stock, and the amount.

2nd. The number of shares held by the states of Maryland and Virginia, and by the individuals respectively.

3rd. The whole sum expended on the works from the commencement of the operations of the company up to the 1st of January, 1822, stating, as far as practicable, the amount expended on the original construction of the works, and the amount expended in repairs.

4th. The amount of debts due from the company on the 1st of January, 1822, shewing to whom due, when contracted, and including principal and interest.

5th. The amount of tolls received in each year from the 1st of August, 1799, up to the 1st of August, 1821, together with the number of boats and tonnage employed, and the produce and merchandize transported during that period, with an estimate of the value of the same.

6th. The mode of expending the annual tolls, giving as *particular* an account as is practicable.

[A.]

OFFICE OF POTOWMAC COMPANY,
Georgetown, D. C. December 20th, 1822.

GENTLEMEN,

By instructions from the board of directors of the Potowmac company, I have the honor to make the following communication :

The letter you were pleased to address to me on the 5th of July last, requesting information relative to the affairs of the Potowmac company, was received soon after its date ; and the requisite documents have been for some time prepared ; but it was thought best to retain them until you should hold another meeting in this town, for the facility of giving explanation, should it be found necessary.

They are transmitted herewith, made up to the first of August last ; this period has been taken, because, as it accorded with the date of the annual returns, prepared according to the practice, for the general meeting of the company, it presented the means of more certainly fixing the sums, &c. As it is later than that designated by you, it is hoped it will not be objectionable.

The paper A, furnishes answers to the 1st, 2d, 3d, and 4th queries put by you in relation to the number, the amount, and the proprietorship of the shares; to the expenditures, and to the debts of the company.

As to the 3d query, no separate accounts having been kept for these items, it has been found impossible to distinguish the amount expended in the original construction of the works, from the amount expended in repairs. And further, that although the whole sum of the expenditures is correctly stated at $ 729,387 29, there has been actually laid out, of money other than that produced by the profits of the works, no *more* than the sum of $ 511,349 62; since, as will be seen by the note at the foot of the paper, marked B, that the sum of $ 216,949 60, received for tolls, supplied so much of the expenditure.

The paper B, gives in detail the information required by the 5th query, as to the tolls received, the boats employed, and the produce and merchandize transported; by which it will be perceived, that since the first use of the navigation in 1800, by means of the works of the company, to speak in round numbers, upwards of *two hundred and twenty thousand dollars* have been received for tolls. A mass of produce and merchandize has been transported on the river, equal in value to more than *nine millions, three hundred thousand dollars*, (as one article of which, one million, one hundred and thirty-five thousand barrels of flour have been water-borne to market;) and that, for the last fifteen years, on an average, seven hundred and twenty boats have been annually employed on the river.

The paper C, exhibits the manner in which the tolls of the last year have been expended, and is intended as a practical reply to your 6th query, inasmuch as they have, in each year, been applied to the objects there described, in greater or less proportion.

Very respectfully, I have the honor to be,

Gentlemen, your most obedient, humble servant,

J. MASON,
President Potowmac Company.

To ELIE WILLIAMS,
ATHANASIUS FENWICK,
WILLIAM NAYLOR,
WM. T. T. MASON,
and MOSES T. HUNTER, Esq's.
} *Joint commissioners on the part of the states of Virginia and Maryland, &c. &c. &c.*

[A^{2}.]

Answers to the Queries of the Potowmac Commissioners.

	No. Shares.	*Amount.*
1st. Capital, or dividing stock, at 100*l.* sterling,	700	$ 311,111 11
2d. Shares held by the state of Virginia,	120	53,333 33 1-3
Shares held by the state of Maryland,	220	97,777 77 2-3
Shares held by individuals,	360	160,000 00
	700	$ 311,111 11

3d. Debts due by the company, up to the first of August, 1822, including interest, viz :

To subscribers to Monocasy loan, contracted in 1803,		$ 3,876 49
Do. " Shenandoah loan,	" 1812,	4,698 77
Do. " Antictam loan,	" 1812,	17,026 33
Do. " Cumberland loan,	" 1813,	7,642 12
State of Maryland,	" 1814,	39,950 00
Banks of the District of Columbia, $ 55,955 17 whereof was contracted between the years 1803 and 1816 ; the remainder in 1816-'17, and '18,		101,192 88
Sundry persons,		1,500 00
		$ 175,886 59

NOTE. The difference between $ 311,111 11, the capital or dividing stock of the company, and $ 336,557 10, the amount actually paid in by the stock, is to be found ; first, in the difference between the price set on the last 230 shares subscribed, above the dividing rate, as fixed for the original shares ; and next, in the diminution of the whole number of shares subscribed, by forfeiture for delinquency and sale, by which the sum was sunk to the profit of the company.

J. MOORE, Jr.
Treasurer Potowmac Company.

[B^2.]

General statement of disbursements made by the treasurer of the Potowmac company, from the 1*st of August*, 1821, *to* 1*st August*, 1822.

Cash paid mechanics and laborers employed on repairs and improvements,	$2,989 09¼
For materials for repairs, &c.	711 98¾
Hire, provisions and cloathing of yearly hands to attend the locks,	346 77
Salaries to treasurer and two toll-gatherers,	1,700 00
Toward principal and interest of debt,	5,276 45½
Contingent,	201 04¾
	$11.225 35¼

JAMES MOORE, Jr. *Treasurer.*

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[C.]

Abstract of the laws of Maryland and Virginia, relative to the Potowmac company.

Charter granted by the states conjointly in 1784; navigation to be improved from tide water to the highest practicable point on the north branch, so as, in dry seasons, to permit the passage of boats drawing 12 inches water. At or near the Great Falls, canal to be made 25 feet wide, 4 feet deep, and locks, if necessary, 80 feet long, and 16 feet wide, to convey vessels and rafts drawing 4 feet water.

The company bound to begin the work within one year after the formation, and to complete the improvement of the navigation from Cumberland to the Great Falls, within ten years, under the penalty of a forfeiture of charter.

MARYLAND LAWS.

1785, chapter 3d. Canal at Great Falls, depth reduced from 4 to 2 feet, spaces between the locks, if any, to be four feet.

1786, chapter 2d. Time of completing navigation from Great Falls to Cumberland, extended to the 17th November, 1790.

1790. Time farther extended for improving navigation from Great Falls to Cumberland, until 1st January, 1795, and liberty given to apply capital and tolls in improving branches of Potowmac above Seneca Falls.

1794, c. 29, extends time of completing navigation to 1st of January, 1798.

1796, c. 19, authorises the contracting of the locks from 16 to 14 feet in breadth.

1797, c. 93, authorises the receipts of tolls as if the locks at the Great Falls were complete; on condition that the company, free of cost, carry all produce that may be brought to the inclined plane, which is stated to be constructed from the lower end of the canal to the surface of the river, below the Great Falls, down and up the said plane, at their own risk. This law further provides for the extension of the time for the completion of the navigation until 1st January, 1803.

1802, c. 84, declares the objects contemplated in the establishment of the company to be completed, confirms the right to tolls, and authorises the construction of the locks from 14 feet to 12 feet in breadth.

1809, c. 193. Further time of ten years given for completing the navigation of Potowmac, to be computed from the expiration of the term already granted, viz: 1st of January, 1803.

VIRGINIA LAWS.

1785, c. 4, s. 2. Company permitted to reduce the depth in canals at the Great and Little Falls, from 4 to 2 feet of water at the least in dry seasons, and if the locks have spaces between them, such spaces to be 4 feet deep.

1786. Time until the 17th November, 1790, for completing navigation between Great Falls and Cumberland.

1790. Farther time given of three years from the 16th of December, 1790, and the company authorised to apply capital and tolls to the improvement of the branches above Seneca.

November 21st, 1791. Right to improve the branches above Seneca forfeited, unless the company proceeded within 12 months from that date.

November 23d, 1793. Time given for a similar purpose, until 1st of January, 1797.

December 26th, 1795. Authorises contraction of the locks at the Great Falls to 12 feet.

December 1, 1796. Gives further time of 4 years, to be computed from the expiration of the time already given, locks may be contracted to a space not less than 14 feet.

January 24th, 1798. Recites that considerable improvements have been made, and authorises the receipt of tolls before the completion of the navigation to tide water, and the further time of two years is given to be computed from the expiration of the period already given.

January 25th, 1800. Further time given until the end of the year 1802.

January 27th, 1803. Recites that the locks at the Great Falls are only 12 feet wide, instead of 14, but declares them sufficient. This act, also, explains the phrase, "dry seasons," as used in the 17th section of the law for extending the navigation, declaring it to mean "all seasons," so far as relates to the navigation from Fort Cumberland to tide water. Commissioners are also appointed by this act to review the works upon the river, &c. They, however, never acted.

Farther time of three years is also given for the completion of the navigation of the river.

January 24th, 1806. Further time of 5 years given for the like purpose.

The above laws are to be found in the second volume Rev. Code, old edition; Appen. No. 2, p. 12–22.

January 11, 1811. Further time of 3 years given.

February 18th, 1817. Further time of 3 years, to be computed from 1st of January, 1817.

NOTE. There are no other laws of Maryland or Virginia, so far as we have been able to ascertain, relating to the kind of navigation required, and the time within which it was to be completed.

[D.]

The JOURNAL of the commissioners appointed by the states of Maryland and Virginia, to view the river Potowmac, and report the state of its navigation, and how far the Potowmac company had complied with their charter; taken from day to day as they descended the river, noting the depth of waters, and condition of its channel.

The notes made previous to the day noted below, were mislaid.

August 6th, 1822—6 miles above Old Town, measured the depth of the river in the sluice made over the ripple, immediately over Sap's run, which is above the Slate Bluff at Wary's, depth 18 inches. At the next ripple above Jacob's island, on which we grounded, the best water was 4 inches deep only. About 100 yards down the island, on the right hand channel, a ripple of large stone, on which we frequently touched bottom in a boat drawing only seven inches water.

Just below Jacob's island, touched in the best water.

In the space of half a mile, grounded again.

August 7th—Left Cresap's landing; opposite to this, the boats stuck fast in about 5 inches water in the best channel; passing Allam mill, the boats rubbed the bottom for a few yards, on a depth of about 6 inches; and between the walls made by the Potowmac company for a sluice, the boats stuck fast.

From this point to Union Taylor's island, the water is at least 18 inches deep.

Opposite to Lanby's mill, boats stuck fast in 4 inches water: Opposite to Old Town, the boats stuck fast again in 4 and a half inches water, taking the best channel.

At the head of a canal, and running through the length of it, water 9 and a half inches deep.

August 8th—Moved from the confluence of the North and South branches of the Potowmac; good water for a short distance to Old Town falls; here, for upwards of 200 yards, the water in the best channel from 7 to 5 inches deep; channel very narrow and crooked; then good water for a small distance; then shoal for 50 yards, affording only six inches water; then good water for a short distance; then entering a long shoal above Taylor's, and extending to the mouth of Town creek; through the whole length of which, the boats rubbed, and were dragged by the men, in water not more than 5 inches deep.

At the mouth of Town creek, there is a wing dam, and sluice; not more than six inches water in the sluice; deep water to Malcomb's island, but the navigation difficult, through scattered rocks; then commences a shoal on which the boats rubbed, and passed with difficulty through a wing dam and narrow sluice; then better water 12 to 15 inches to O'Neil's bottom; here, the boats moored for the night.

August 9th—Moved on through good water past Malcomb's island, and mouth of Little Capon, on the Virginia side, to Coxes' falls; then passed an island, along which are three rapids, extending upwards of a mile; the boat rubbed the whole way, except about 100 yards between each rapid, when the water was from 2 to 3 feet deep, with rocks standing above its surface a part of the way. Below this, the water is good for a mile, when we arrived at a rapid called the Devil's Nose, above Col. Greenwell's house. At the rapid, are wing dams, and a narrow and shallow sluice of difficult navigation; then good water for 100 yards to Greenwell's ripples, 100 yards in length, where the boats rubbed; then better water to a reef of rocks crossing the river, leaving a narrow channel; then good water to John Mitchell's bottom, except a reef of rocks, where there is a small fall; then good water from 5 to 20 feet deep, opposite to McDonald's on Virginia side; then water good for ½ mile to Mitchell's rapids, half a mile long, on which are six reefs across the river, making a narrow, crooked and very difficult channel.

Stopped at Boxwell's for the night.

August 10th—Moved from Boxwell's, for 200 yards good water; then encountered small falls or ledges of rocks quite across the river; 300 yards, the water from 3 to 8 inches deep; good water for ¼ mile; then for the next mile several ripples; water 4 inches, along, or over which, the boats were dragged.

Between the ripples, the water is good; came to Swede's falls ½ a mile in extent, the boats frequently rubbing and passing with difficulty.

August 12th—Moved from McAtus' ripples, where for some distance, above and below, there are large rocks standing two or three feet above the surface of the water, and so numerous that the passage between them is very intricate, making it necessary to cross and re-cross from shore to shore; sometimes hanging upon the ripples where there was not more than 4 inches water: These ripples continued a considerable distance, the boatmen having frequently to get out and lift and drag the boats. Immediately above the Tumbling dam falls, there is a shallow bar affording only 4 inches water. Among these falls, there is one of a perpendicular pitch of apparently 18 inches, and exactly in the boat channel. Besides these natural obstructions, there are here, and at many other places, artificial ones, made by building fish dams in the river, in shameful violation of the law. Below the Bear falls, the boat hung and rubbed for a long distance in water not more than from three to four inches deep, and before she could pass, the boatmen were under the necessity of going into the water and clearing the channel, by throwing out the stones. Good water one half mile with some short interruptions; afterwards, came to another long ripple where the boat hung for a long time, notwithstanding all the exertions of the men, the water not more than 3 inches deep.

August 18th, started from Neal's. Commissioners' boat supposed to draw about 7 inches water, good water for a short distance, then grounded on a ledge of rocks, running across the bed of the river; 200 yards lower down, ledges occur again for several hundred yards, on which we occasionally rubbed without stopping: farther on, grounded on small gravel, the men had to drag the boat near 50 yards, water varying from 8, 10 to 12 inches deep; for 50 yards farther, water very little deeper, when the boat had again to be dragged; passed great numbers of shallows this day, of from 5 to 6 inches in depth, among which was a fish dam firmly cemented with mud; for a 100 yards, good water, then frequently rubbed and twice stopped on a large stone which covered the bed of the river; good water for 2 or 300 yards, river filled with scattered stones rising 12 or 18 inches above water; then water good for a short distance; then our course was interrupted by a fish dam and broken sluice, the boatmen obliged to throw stone out of the way; farther down, grounded on stone abounding here in the bed of the river; nearly abreast of Mr. Tidball's house, a reef crosses the river and causes a small fall 5 or 6 inches, over which we passed without difficulty; a reef with a similar fall just below the above, obliged the boatmen to shove and lift the boat over; farther down, passed another reef on which we touched; a sluice made through it, misplaced and not used; then reached a gradual fall on which grounded and passed with difficulty, having to clear a passage; then a few yards of deep water; then rubbed for many yards; again a space of good water; then grounded on large gravel; dragged some distance; then floated a little; then dragged again 20 yards, into a few yards passable water; then dragged again into water which continued good for near half a mile; then rubbed again on small gravel; floated a little; then rubbed on large gravel, and soon stopped on a rapid; about 100 yards above Lantz's house and island, dragged over with difficulty; then good water to Lantz's, where we stopped for the night.

Wednesday morning, August 14th—Moved from Lantz's, on shoal water; boat rubbed frequently, and with difficulty passed the small opening in ledges of rock across the river; these openings laying in zigzag line, render them very difficult of access; the boats rub hard at most of the passes; these clifts and shoals extend upwards of a mile around the head of Washington bottom; then good water half a mile; then ledges of rocks rising to the surface in three feet water, with narrow shoal passes, rendering the navigation difficult, and extending upwards of half a mile; then shoal water from shore to shore about three quarters of a mile past Dimmit's island; at one place boats could not pass until stones were removed, to make a small channel; the impediments through this shoal can only be overcome by swelling the water by dam; then good water three quarters of a mile to O. Queen's; then shoal water; boats rub, and are dragged a mile; then good water to the Burnt Mill falls; here is a wing dam 12 or 15 inches high, turning the water to the Maryland shore, working a small grist mill, owned by Thomas King; fall at the mill, 3½ feet; a rapid shoal extends near 200 yards from the upper end of the wing dam, and ends nearly opposite the mill; then good water 200 yards to a point opposite to Marshall's house, on the Virginia shore, where the boats moor for the night.

Thursday morning, August 15th—Moved from Marshall's; good water continued half a mile to a ripple below the mouth of Fifteen Mile creek; at this ripple, ¾ of the width of the river, is here 150 yards distance, leaving a narrow, crooked, and shallow channel, through which the boats rub; then good water about 100 yards; then a ripple 100 yards, through which the boats rub nearly the whole way; then the water deepens to three feet, with scattered rocks, near the surface, a quarter of a mile; then a ripple, a wing dam, and a shoal very shallow; then good water 100 yards; then appear ledges of rocks across the river, six in number, about equal distance from each other, and extending 150 yards down the river; boats rub through the narrow passes on these ledges. Then, good water by the Man-of-War Rock, opposite Matthew Engle's; then a short reach of good water to Willet's falls, or long canal; through these falls the boats were dragged with great difficulty; after passing them, enter on water with ledges of rocks across the river; there, and below where shoal water extends across the river a considerable distance, passing Sidling Hill creek, and to Ferree's, no loaded boat drawing 8 inches of water could pass. The boats moored opposite Ferree's for the night.

Friday, August 16th—Shoal and difficult water by ledges of rocks and ripples; passed Big Capon, and to the upper end of Ridout's bottom; then good water 100 yards; then shoals and ledges of rocks, boats passing through narrow and crooked openings, one among rocks four feet above water; the only pass very narrow and close to the Virginia shore; then variable water, the greater part shoal, to the mouth of Little Branch, below Mr. Summer's.

August 17th—Moved from nearly opposite Mr. Summer's, living on the Maryland side, and 5 and a half miles above Hancock; good water a short distance; then passed a reef of rocks with a fall of near 3 feet, extending quite across the river, and about 50 yards in width, the boat rubbing part of the way, and dragged about 10 yards by the men, the water from 5 to 10 inches; then 1 and a half mile of water from 20 inches to 3 feet; then 150 yards of ripple, the water upwards of 12 inches, but the large stones rising above the surface so numerous as to render it very difficult for the boat to pass along; then a half or three quarters of a mile of good water; then a ripple one quarter of a mile in length above Round Hill, water from 6 to 12 inches, good water a short distance; then another ripple through a canal below Round Hill, water about 7 inches, except through the shute of the canal, where the boat grounded; then good water to Hancock, with the exception of two ripples about a mile above the mouth of Little Tonoloway, the one 50, the other 30 yards long, the water from 6 to 10 inches deep; the boat rubbed part of the way, and twice grounded; moored at the mouth of Little Tonoloway.

August 18th, Sunday, 19th, 20th and 21st, lay at the mouth of Little Tonoloway, whilst the levellers went back to Cape Capon to survey the route from thence to Hancock, on the Virginia shore.

August 22d—Set off with the boats from the mouth of Tonoloway, a few perches of good water at first, then three ledges of slate rock across the river, two opposite Hancock, and one just below, on all which we rubbed; between them a few perches good water; then good water to the lower end of Donovan Island, where another ridge crosses, at which there is a fish dam, and fall of 9 or 10 inches, and difficult crossing, good water opposite the mouth of Warm Spring Run, (Bath,) a little good water; then a shoal, and reef, slate and gravel; grounded; then good water, touched another reef, passable water 50 yards; then large stones so close as to prevent passing without rubbing; then grounded in 9 inches water on a shoal and fish dam, 8 inches water; stone too close to allow an uninterrupted passage, some passable water to the upper end of Yates' island; then grounding, rubbing, and touching abreast of the island; Big Tonoloway enters just above this island; for half a mile bad water, 5 or 6 inches only; bad water, and two more ledges of slate with 5 inches water on them above widow Rowe's or Bevins' island; tolerable water abreast of Island for 300 yards.

August 23d—Moved from opposite doctor Jacques' house, where the canal crosses from Virginia to Maryland, good water for 150 yards; then shoal begins opposite Jacques' island; water from 5 to 8 inches, boats rubbed for 80 yards, and then grounded, and hands had to open a channel by removing the gravel and stones; not 3 inches water, boats lifted over with hand-spikes; after this, water deepens to about 10 inches or a foot, filled with large loose stones, which impeded the navigation, and caused the boats twice to get fast; good water begins below fish dam, opposite lower end of Jacques' island, and continues to about 100 yards below upper point of Miller's island, about half a mile, where begins a shoal at a fish dam, where hands had to make a channel by removing stones, &c. for 20 yards, water at 4 to 6 inches; then increases to nine, but interrupted by stones and rocks for about 50 yards; then shoal from 10 to 4 inches, for distance to Licking, say one and a half mile; men out again, and making channel between upper and lower point of Miller's island, and repeatedly aground on ledges between this island and Licking; moored at mouth of Licking.

August 24th—Moved from mouth of Licking; good water for 100 yards, to a fish dam; then rapid, and full of big rocks; boat fast, from 6 to 8 inches; water then good for 150 yards, to another dam, below which is a rapid of short continuance; then water sufficiently deep, but bed very rocky for 80 yards, boat rubbing on the rocks; here a line of large slate rocks reaches nearly across the river; boats fast among them; deep water from this for 50 yards; then shoal, and boats fast upon a bed of large stone; then rocky bottom, but good water for 80 yards, to a fish dam; boat occasionally touching on the large stones; several ledges here cross the river upon one of which boat got fast; below this, deep water with slate ledges, upon which boat repeatedly got fast; this kind of water and bed continues for one and a half miles; in this distance, a bed of moss, across the river, extends for half a mile; good water through it, but full of rocks.

This water extends to Elm spring, on Md. side; a shoal then begins, and continues for upwards of half a mile; boats fast, and lifted over with great labour; men obliged to open a channel, by removing stone, &c. This shoal extends to Cherry run, on Va. side, with the exception of about fifty yards, just above fish dam; below which, is a rapid for a few yards, and then good water for 1¼ miles to head of Johnson's falls, nearly opposite Back creek, on Va. side, where we moored for the night.

Sunday, 25th—The boats lay to, and the party rested.

Monday morning, August 26th—Moved from Johnson's falls; shoal water to Garrison's falls, one and a half mile; here are high ledges of rocks extending across the river, and only one narrow pass for boats; then good water, the Fiddle Strings, so called from four ledges of rocks near each other, and appearing above water, extending across the river; the boats passed this ripple with great difficulty, there being no passage affording sufficient water, the boats were lifted and dragged over by doubling the crews, and were more than an hour in moving less than 100 yards; then good water to Claycomb's ripples; then shoal, from shore to shore, to Potts' spring; boats rubbing; then good water to Prather's saw mill, made by his mill dam; then shoal ¼ mile; whole distance from the Fiddle Strings, four and a quarter miles, to Prather's, where the boats moor for the night.

Friday, August 27th. Moved from Prather's on good water, passing Charles's mill at the mouth of the Big spring run, half a mile good water, continues to Barkman's fish dam raised in a shoal part of the river extending a quarter of a mile; here the boats passed with great difficulty, being dragged and forced over the shoals by doubling the crews in several places, and by making little channels, by moving the stones in the way.

The water is then better for a small distance, say a quarter of a mile, which reaches another shoal called Tryal fish dam, a very appropriate name, as it sufficiently tried the strength and skill of the men, in lifting and dragging; the boats rubbing the whole distance of two hundred yards and upwards: the water then became deeper for a short distance; then very shoal to Middlecalf island and some distance along it: the water then good to the mouth of little Conogocheague at Middlecalf; then becomes shoal passing two islands known by the name of Buzzard islands, and then on passing Hawk's island; the whole of this distance the water very shoal, the boats were got over with great difficulty, and by doubling the crews, one mile and a half, the water becomes then deeper; the boats after passing a quarter of a mile, put in for the night.

August 28th.—Left the upper end of a high ridge of rocks on the Va. shore, above 5½ miles above Williamsport; for two miles, the water 8 or 10 feet, the boatmen using their oars the whole distance. The next mile the water varying from 4 feet to 18 inches; then a mile of about one foot water, moored for the night about 1½ miles, above Williamsport.

August 29th.—Left the station 1½ miles above Williamsport, the river being wider than at any place above, the boats rubbed on the ground a great part of the way, to Williamsport, where we were detained 4 hours, by the hands going on shore from Williamsport to the place called Falling Water on the Va. side; the boats often stuck fast, and were only got along, by lifting and dragging them, by main force.

August 30th.—Started from the Falling Waters; water good; velocity of the current diminishing; general depth increasing, and the navigation less frequently interrupted by reefs and shallows; in the space to Hadley's rock, about 2¼ miles, a fish dam on a gravel bank, and two ledges of limestone rising near the surface, are the only difficulties, but were passed with a rub; the bed of the river for the above space, is uniformly limestone rock; opposite Lefebre's house, it rises and forms the bank of the river on Va. side, for 50 yards; at Hadley's, the rock displays itself on the shore for more than a quarter of a mile on the Md. side. A fish dam and ripple on which we grounded just below Hadley's; then good water till we passed the mouth of Opecon, when we grounded on Opecon ripple, where there is another fish dam and water about 9 inches deep; then a little good water; then grounded again on Opecon ripple; moved on a little; then rubbed hard again; then better water for ¾ of a mile above Opecon; rocky shore on the Md. side; just below, the rocks approach the shore on the Va. side, and continue for 1¼ miles; another fish dam obstructs the navigation on Opecon ripple; and then three narrow reefs of limestone rocks; below, this last dam across the river on which there is not more than 6 or 7 inches water; then deep water to Spring's mill, where we stopped for the night. Considerable fall in the water in the space occupied by Opecon ripple; here Boyd went home for a day, and party rested Saturday and Sunday.

September 2d— Started from New-Comer's; good water for a mile and a half; cliffs on Md. side for a greater part of the way; a ledge of limestone extending nearly across the river, just below Galloway's mill, but does not interrupt the navigation; water very deep, out of the reach of the pole; water good to Mills's spring, except about two hundred yards of shoal water.

Sept. 3d—Left Mills's spring; good water for three quarters of a mile; then pass a fish dam; then good water for half a mile; then another fish dam; good water, but interrupted by big rocks and ledges; ripple continues about a mile; wing dam made by Potowmac company about mid way; then ripples; boat fast on a ledge of rocks in 5 inches water; good water for a mile; then fast on a ledge of rocks at Zuck's fish dam; water variable; passing three fish dams to the head of Ground's ripples, two miles. Boats moored at Spong's landing, for the night.

September 4th—Moved from Ground's ripples; shoal water a short distance; boats rub at one place on a ledge of rocks; the navigation interrupted by ledges of rocks, ranging with the current, where is a fall of three or four feet, in a quarter of a mile; narrow passes through those ledges; then good water to Chapline's; then shoal a short distance; then good water to Shepherdstown.

Thursday, September 5th—Moved from Shepherdstown, on good water, half a mile; then shoal from shore to shore; ledges of rock, with few passes for boats; very difficult navigation; the channel shoal and winding; boats rub, and are dragged, in many places, through this shoal, which extends a mile and a half; then good water to the Anticlam forge ripples; a narrow ledge of rocks across the river, with but one shallow and narrow pass; the falls in this ledge about a foot; then good water to Coons's, where the boats put in for the night.

Friday, September 6th—Set off from Coons's, two miles below the Anticlam iron works, with a fine sheet of deep water; ¼ mile below this, river bends suddenly to the west; is wide, and too deep for poling. At Reynolds' mill, river bends to the south; at the bend, a rocky island on the Md. side, and rocky shore on the Va. side; water deep to the end of the island, where a ledge of limestone crosses the river obliquely; here we enter the Cow Ring sluice, on the Va. side. This sluice is formed in the most approved manner, by the assistance of nature, and a ledge of rocks so situated as to throw the collected water of the river into the sluice. With this advantage, the greatest that can be obtained by wing dams, you have the increased rapidity of the current to surmount, which is so great as to require a capson, which is placed at the head of the sluice, by which a boat is drawn up slowly, and with much labor. The force of the current is, moreover, so great, as to dislodge the stones on the walls, and even large ones, flat and well placed; so that sluice navigation, under the most favorable circumstances, is a miserable shift.

Below this sluice, water deep, little current; river bends to the south; 1¾ miles below the sluice, is an extensive hill, on the Va. side, coloured with the oxide of iron; in it, a considerable excavation for ore. This bank furnishes ore to the Anticlam works; ore said to require mixing. Below the sluice, water deep; river bends S. W.; in the bend, cleft of rock approaches the shore, opposite Keep Trice's old furnace; a large ore bank on the Md. side, and the Va. banks shew signs of ore. Below the furnace, Va. side, high rocky shore. The river without obstacle, until you reach the head of the Canal (as it is called,) on the Md. side, which we found closed by a dam 2 feet high, made to enable the public works to continue in operation during the extreme lowness of the water at this season.

To surmount this obstacle, by agreement with the superintendent at Harper's Ferry, (Mr. Stubblefield,) we passed over to the canal race of the public works, and had our boat drawn out on a carriage into the river, near the ferry, crossing without any interruption of our work. At the head of the long canal, (so called,) a rapid commences, and the bed of the river is uniformly covered with fixed rock and huge stones, projecting three or four feet above the present level of the river; presenting an aspect, terrific to the beholder, and dangerous to the navigator. This appearance, and state of the river, continues to the ferry, a distance on the Md. side, of about 2 miles; the fall in that space, ascertained to be 27 feet. To improve the navigation through the rapid, the Potowmac company have constructed, at great expense, partial channels on the Md. side, 3 in number. The first with a tolerable level bottom, clear course, 18 or 20 feet wide; and the two others, with very unequal bottoms, and irregular course, affording an imperfect and dangerous navigation in high water; but now 2 feet above the level of the water. Along the whole course of these rough passage ways, a broad wall at the foot of the rocky mountain, which here binds the river, is used for a tow path; along which, boats are dragged up. The boats stopped this night at the head of the long canal; and, next morning, the boats were hauled over into the river.

September 7th.—Started from Harper's ferry, and ran through the spout, which is extremely rapid and rocky for a distance of three hundred yards, or more, making a very crooked passage among dangerous rocks, and must be a most hazardous navigation at any time, and cannot be improved, but at an expense which would make a good independent canal for the same distance. For the last [illegible], and apparently for some miles ahead, it would [illegible] beholder at low water, to be told, that the river could be navigated at any time, so numerous, so large, and so prominent are the rocks covering the whole bed of the river; the imperfect channel, called a canal, made by the Potowmac company, being at this time entirely dry.

In the run this day, but especially through that part of the river called the Spout, our boats struck very hard against many of the rocks; and had not our boats been very tight, they must have been wrecked; the boats put in opposite Mr. Weaver's meadow for the night.

September 8th.—Being Sunday, the boats lay to until Monday, Sept. 9th; then removed; passed the mouth of Pleasant Valley, at Weaver's mill, on rough and shoal water, amidst rocks from three to six feet high, from shore to shore, the passes between the rocks very narrow and irregular, making it necessary to traverse the river from side to side, to gain the passes; this rugged bed in the river continues above a mile, with considerable fall at different places, one called Devil's Elbow, at Payne's falls, opposite Payne's island, between which and the Md. shore, is wall work made by the Potowmac company, as a canal for boats; but which channel is now dry: below this, enter Dever's mill dam, formed of brush and stone, obliquely in the river, to throw the water to the Md. shore; this dam is much complained of by boatmen navigating the river, and was found to prevent our boats from passing through the best channel, and turned them at a right angle to the middle of the river; the boats rubbed frequently on the narrow passes between the rocks, which continue with less fall in the river, to Philpotts', or Payne's ripple, a mile and a half; here, we were clear of the South mountain, a rocky shore on the Va. side from Harper's ferry; the water variable, interspersed with rocks and shoal to Berlin, and a mile below it; the boats put in for the night.

Tuesday, September 10th.—Wm. Naylor, Jr. employed to take the meanders of the river, brought on that work from Cumberland to a stake in Casper W. Weaver's meadow, which he reached on the evening of Saturday the 7th instant, and declining from indisposition to progress any further with that work, it became necessary to employ another surveyor in his place; Corbin West, engaged in that service this morning, and the boats proceeded on water, varying in depth mostly shoal through scattered rocks and over ripples, often rubbing, and with difficulty getting through the narrow passes or ledges of rocks; in fine, it may be truly said, that from the head of the Long canal above Harper's ferry, to Sonder's ripple and Lucket's ferry, above twelve miles, no navigation is afforded for boats of any burthen, in low water, nor can it be deemed either good or safe, in the best state of the water, from the great number of rocks which crowd the river a great part of the way, and are seen from three to ten feet above the surface of low water; from Lucket's ferry, to the head of Hooks' falls, good water half a mile; then shoal and rocky through these falls, where the river passes the break in the Katockon mountain; 1½ miles are more rocks and difficult navigation; then good water passing Jenkins' island, to a fish dam; then shoal water; boats rub and pass two other fish dams, in very shoal water to the Kanawa spring, opposite Kemp's island, where the boats put to for the night.

September 11.—Remained at Kanawa spring opposite Kemp's island until after dinner, waiting for the engineer to come down with his work: started about 2 o'clock and reached Noland's ferry, a distance of about three and a half miles, where we moored for the night. The first two and a half miles good water, from 2 to 4 feet; the last mile shoaly, the water from 10 to 16 inches, along which we were enabled to keep our boats afloat, only by frequent windings.

September 12.—Started from Noland's ferry, water good for one half of a mile; then shoal, being about 10 inches; this water continues for about 150 yards to an old fish dam, just below which boats got fast; this shoal continues for at least one half of a mile; boat occasionally rubbing, and once more fast; then good water to Monocacy, at the mouth of which one of the boats got fast; thence good water to Holm's ferry; thence to Douglass's red rock, generally good water; the boat, however, scraped once or twice; water very shoal, and boat fast at head of Clapham's island; shoal water during the whole length of this island.

MR. BRIGGS' REPORT.

To the commissioners appointed by the states of Virginia and Maryland, to investigate the affairs of the Potowmac company, and to suggest such measures as may produce the benefits which would result from practical improvements of the navigation of Potowmac river, Isaac Briggs, in pursuance of authority conferred on him, by the Board of Public Works of Virginia, and of the approbation of the said commissioners, as successor to the late engineer, respectfully offers the following

REPORT.

GENTLEMEN,

From the notes of Thomas Moore, the late engineer, (notes which he left in pencil writing,) I have carefully, and in datail, calculated and arranged all the estimates of expense necessary for constructing, along the valley of Potowmac river, an independent canal, in which the water is intended to be 30 feet wide on the surface, 20 feet wide at bottom, and 3 feet deep. The notes of the late engineer, commenced at Cumberland, and extended to a few perches more than 23 miles below Harper's ferry, 150 miles. In order to arrive at the greatest possible accuracy in making the estimates of cost, the line has been taken in minute portions, and each calculated separately, as the site has varied, according to the difficulty or facility, and of course the greater or less expense necessary for constructing a good canal. For the various kinds of works, prices have been assumed which have well sustained the test of experience, extensively in the state of New York, and, in some measure, in the state of Virginia. I, therefore, confidently believe, that if the execution of the work be faithfully and prudently managed, its cost will not exceed the estimate.

It has been deemed expedient to divide, into sections, the proposed canal, for the purpose of facilitating its execution. The first section extends from its commencement at Cumberland, in Maryland, to the mouth of Capon, in Virginia, fifty-four and a half miles. The second section, from the mouth of Capon to the mouth of Great Conogocheague, or Williamsport, in Maryland, 33½ miles. The third section, wholly on the Maryland side of the river, from the mouth of Great Conogocheague to Harper's ferry, opposite to the mouth of Shenandoah river, 38¾ miles. The fourth section, still on the Maryland side from Harper's ferry to the head of the Great

Falls, 46¼ miles; and the fifth section, still on the Maryland side, from the head of the great falls to tide water in the District of Columbia, 12 miles; amounting altogether to 185 miles of canal navigation, from Cumberland to tide water.

RECAPITULATION.

THE FIRST SECTION,

Commences at Cumberland, in Maryland, and crossing the river three times, terminates at the mouth of Capon, on its western bank.

The first crossing to the Virginia shore, just above Cresap's landing, 16 miles from Cumberland, is by a dam of suitable elevation; then descending by locks into the still water, above the dam, we pass through a guard lock into a canal on the opposite shore.

The 2d crossing to the Maryland shore, is also by means of a dam placed just below the mouth of South Branch, 19 miles from Cumberland, to raise the water in Potowmac 8 feet. In every case where a dam is the means of crossing a river, a guard lock is indispensable at the entrance of the canal on the opposite shore. Aqueducts, however, as the mode of crossing rivers with a canal, are, on account of the superior safety and convenience which they afford to navigation, decidedly preferable to dams, although more expensive in construction; yet where we cannot avail ourselves of sufficient feeders from side streams to keep always a full and certain supply of water in our upper levels, dams are adopted, because, by them we obtain from the river an abundant supply. This is precisely the case on the first crossing; and, in the second, there is not sufficient elevation for an aqueduct.

The 3d crossing to the Virginia shore, 29 miles from Cumberland, is by an aqueduct, which, by maintaining a level sufficiently high to be safe from freshets in the river, will augment the expense of a piece of walling just above, $ 3,900.

SUMMARY OF THE ESTIMATES OF EXPENSE.

For excavation, wallings, aqueducts, dams, &c. including 6 culverts noted by the engineer,	$ 262,656 00
The extra expense of a wall mentioned above,	3,900 00
For lockage 146 feet, (in 18 locks) at $ 650 per foot,	94,900 00
For 48 culverts (in addition to those in the first item,) at $ 200 each,	9,600 00
Amount carried forward,	$ 371,056 00

Amount brought forward,	$ 371,056 00
For 30 farm bridges, at $ 300 each,	9,000 00
For 4 road bridges, at $ 500 each,	2,000 00
	$ 382,056 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.	38,206 00
Amount of estimates for the upper section from Cumberland, to the mouth of Capon 54½ miles, ($ 7,711 per mile which in the same proportion for a canal of the dimensions of those in New-York, 40 feet wide and 4 feet deep, would be $ 13,983 per mile,)	$ 420,262 00

THE SECOND SECTION,

Commences with an aqueduct across Capon, and continuing on the Virginia side 14 miles, crosses Potowmac on an aqueduct to the Maryland shore, and terminates at the western bank of the great Conogocheague.

SUMMARY OF ESTIMATES OF EXPENSE.

For excavation, walling, aqueducts, dams, &c.	$ 184,413 00
For lockage, 72 feet (in 10 locks) at $ 650 per foot,	46,800 00
For 33 culverts, at $ 200,	6,600 00
For 20 farm bridges, at $ 300,	6,000 00
For 3 road bridges, at $ 500,	1,500 00
	$ 245,313 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.	24,531 00
Amount of estimates for the second section 33½ miles, ($ 8,055 per mile; rated in proportion to their dimensions on the canals of New-York, it would be $ 14,606 per mile,)	$ 269,844 00

THE THIRD SECTION,

Commences with an aqueduct across Great Conogocheague; and, continuing on the Maryland side, terminates at Harper's Ferry.

SUMMARY OF ESTIMATES OF EXPENSE.

For excavation, walling, aqueducts, dams, &c.	$ 228,313 00
For lockage 80 feet 8 inches (in 10 locks,) at $ 650 per foot,	52,442 00
For 33 culverts, $ 200 each,	6,600 00
For 30 farm bridges, 300 "	9,000 00
For 5 road bridges, 500 "	2,500 00
	$ 298,855 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.	$ 29,885 00
Amount of estimates for the third section, 38¾ miles, ($ 8,483 per mile; rated on the canals of New York in proportion to their dimensions, it would be $ 15,383 per mile,)	$ 328,740 00

THE FOURTH SECTION,

Commences at Harper's Ferry; and continuing on the Maryland side, terminates at the head of the Great Falls.

SUMMARY OF THE ESTIMATES OF EXPENSE.

For walling, excavation, aqueducts, dams, &c.	$ 229,679 00
For lockage 86 feet, (in 11 locks,) at $ 650 per foot,	55,900 00
For 73 culverts, $ 200 each,	14,600 00
For 37 farm bridges, 300 "	11,100 00
For 8 road bridges, 500 "	4,000 00
	$ 315,279 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.	$ 31,528 00
Amount of estimates for the fourth section, 46¼ miles, ($ 7,499 per mile; rated on the canals of New York in proportion to their dimensions, it would be $ 13,598 per mile,)	$ 346,807 00

THE FIFTH SECTION,

Commences at the head of the Great Falls; and, continuing on the Maryland side, terminates at the head of tide-water navigation, in the District of Columbia.

SUMMARY OF THE ESTIMATES OF EXPENSE.

For excavation, walling, aqueducts, dams, &c.		$ 103,527 00
For lockage 40 feet, (in 5 locks,) at $ 1,000 per foot,		40,000 00
For lockage, 62 " " 9	$ 750	46,500 00
For 12 culverts,	200 each,	2,400 00
For 5 farm bridges,	300	1,500 00
For road bridges, (none,)		
		$ 193,927 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.		19,393 00
Amount of estimates for the 5th section, 9 miles, ($ 23,702 per mile; rated on the canals of New York, in proportion to their dimensions, it would be $ 42,979 per mile,)		$ 213,320 00

GENERAL SUMMARY.

For 182 miles of canal, comprising, beside excavation, walling, aqueducts, and dams, 487 feet of lockage, 205 culverts, 122 farm bridges, and 20 road bridges,

For the 1st section,	54½	miles,	$ 7,711	per mile,	$ 420,262	00
" 2d,	" 33½	"	8,055	"	269,844	00
" 3d,	" 38¾	"	8,483	"	328,721	00
" 4th,	" 46¼	"	7,499	"	346,807	00
" 5th,	" 9	"	23,702	"	213,320	00
Amount,	182	miles,	$ 8,676	pr. mile,	$ 1,578,954	00

This average rate on the whole canal, $ 8,676 per mile, would, if applied in exact proportion to a canal of the same dimensions as those in the state of New-York, be $ 15,732 per mile; and this accords with the actual cost of such parts of the New-York canal as resemble our's in amount of lockage and in laborious excavation.

All which is respectfully submitted.

ISAAC BRIGGS.

Georgetown, D. C. 12th mo. 19, 1822.

PART III.

EIGHTH
ANNUAL REPORT

OF THE

PRESIDENT AND DIRECTORS

OF THE

BOARD OF PUBLIC WORKS,

TO THE

GENERAL ASSEMBLY OF VIRGINIA,

SEVENTEENTH DECEMBER, 1823.

RICHMOND:
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OFFICE OF THE BOARD OF PUBLIC WORKS,
RICHMOND, 17th December, 1823.

To the honorable the Speaker of the House of Delegates,

Sir,

I have the honor to lay before the General Assembly, the annual report of the president and directors of the Board of Public Works, prepared in conformity to the act entitled, "an act creating a fund for internal improvement."

I have the honor to be,
With great respect,
Your obedient servant,
JAMES PLEASANTS, Jr.

REPORT.

The president and directors of the Board of Public Works, in obedience to the act entitled, "an act to create a fund for internal improvement," beg leave to report to the General Assembly, that the fund for internal improvement consisted, on the 1st day of December, 1823, of the following stocks, viz:

PERMANENT FUNDS.

125½	shares of stock in the Little River turnpike company,	$12,550 00
70	shares of stock in the Dismal Swamp canal company,	17,500 00
125	shares of stock in the Appomattox canal company,	12,500 00
70	shares of stock in the Potowmac company,	31,111 11
250	shares of stock in the James River company,	50,000 00
7947	shares of stock in the Bank of Virginia,	794,700 00
3334	shares of stock in the Farmers' Bank of Virginia,	333,400 00
900	shares of stock in the Bank of the Valley,	90,000 00
231	shares of stock in the Northwestern Bank of Virginia,	23,100 00
82	shares of stock in the Swift Run Gap turnpike company,	4,100 00
	Total amount of permanent funds,	$1,368,961 11

of which amount, the sum of $ 1,357 23, belonging to the James River surplus fund, constitutes a part, and subtracted therefrom, will leave the balance before stated at the credit of the general fund.

The certain and probable charges upon the income of the fund for internal improvement for the succeeding year, will be:

The appropriation to the James river fund,	$ 18,000 00
The appropriation to the map of the State in full,	4,478 29
Further requisition on the Roanoke canal stock of	8,000 00
Instalments in full of the loan to the Richmond dock company,	7,500 00
2d instalment to the Fallsbridge turnpike company,	8,000 00
2d and 3d instalments to the Snickers Gap turnpike company,	10,000 00
Requisition on the Monongalia navigation company stock,	8,470 00
Instalment to the Lynchburg and Salem turnpike company,	5,000 00
2d, 3d and last instalments to the Wellsburg and Washington turnpike company,	4,000 00
1st instalment to the Fairfax turnpike company stock,	1,333 33
1st instalment to the Fauquier and Alexandria turnpike company stock,	7,500 00
Expenses of the board, officers' salaries, expenses of surveys, &c.,	7,000 00
	$ 89,281 62

To meet which, the resources of the fund will probably be as follows:	
Balance in the treasury,	$ 8,261 78
From the Farmers' Bank of Virginia,	13,476 00
From the Bank of Virginia,	46,314 50
From the James river company, for dividends,	6,816 00
From the Dismal Swamp canal company, for dividends on United States' Bank stock loaned them,	3,000 00
From the Little River turnpike company,	502 00
Amount carried forward,	$ 78,370 28

Amount brought forward,	$ 78,370	28
From the Bank of the Valley,	6,600	00
From ditto, due in July last,	3,300	00
From the Northwestern Bank of Virginia,	1,386	00
From ditto, dividends due in July last,	203	23
From the Richmond dock company, for dividends on stock of the Bank of Virginia, loaned them,	1,312	50
	$ 91,172	01
Probable surplus,	$ 1,890	39

The preceding exhibit of the state of the fund for internal improvement is made out to the 1st day of December, 1823, to which period it has been limited, in consequence of the accounts of the fund in the books of the treasurer and second auditor being balanced on the last day of each month, and the balance on hand in all future reports upon the state of the fund will correspond with the books of the treasurer and 2d auditor. It will appear, from this review of the state of the fund, that the receipts of the next year will be sufficient to meet all the existing engagements of the Board of Public Works, and that there will be a small surplus on hand after complying with all of them. This sum, however, is too small in amount to authorise the creation of any new engagements to be complied with during the year. The receipts, composed of dividends on bank stock and the stocks of incorporated companies, constituting the capital of the fund, are estimated to be equal to the income derived from the same resources during the past year. In the enumeration of the charges to be paid out of the income of the next year, no existing engagement, it is believed, has been omitted; it is probable, however, that the conditions upon which subscriptions have been made to the Fairfax turnpike company, and to the Fauquier and Alexandria turnpike company, will not be complied with, within the year; in which case, the estimated surplus will be increased by the sum of $ 8,833 33, the amount of instalments due upon subscriptions made to those companies.

During the present year, the Board of Public Works will have complied with their engagements to the Richmond dock company, the Wellsburg and Washington turnpike company, and the Monongalia navigation company; and will have paid the balance due on account of the map of the State. The payments on these several accounts will amount to $ 24,448

29; and, during the succeeding year, the engagements with the Roanoke navigation company, Fallsbridge turnpike company, and Snicker's Gap turnpike company, amounting to $ 18,600, will have been completed.

From this view, the disposable fund, at the expiration of the next year, will be greatly relieved, and at the termination of the succeeding year, will be still farther liberated from charges upon it, and will afford, during the next succeeding year, the means of encouraging and promoting other works of internal improvement. It may also, with reason, be expected, that within the period last mentioned, the disposable fund will be increased by the dividends of some of the companies, in the stock of which the Board of Public Works are interested.

The board, at their last annual meeting in January, elected col. William McRee their engineer, who declined accepting the appointment conferred upon him. The president of the board, upon receiving a letter from this gentleman, declining the office, convened a meeting of the directors in the month of April; at which meeting, capt. Claude Crozet, professor of engineering in the academy at West Point, was appointed principal engineer of the State, who arrived in this city on the 1st day of June, and took the oath of office prescribed, on the following day; immediately thereafter, and as soon as the necessary preparations could be made, he entered upon the duties previously prescribed by the board. His reports, which are herewith communicated, will shew what part of the duties required of the engineer were performed during the short season which remained for operations in the field.

Copies of reports and returns from the Little River turnpike company, the Dismal Swamp canal company, the Appomattox canal company, the Potowmac company, the Swiftrun Gap turnpike company, the Roanoke navigation company, the Richmond dock company, the Leesburg turnpike company, the Cartersville bridge company, the Fallsbridge turnpike company, the Snicker's Gap turnpike company, the Monongalia navigation company, the Lynchburg and Salem turnpike company, and the Cartersville bridge company, for the last year, not received in time to be included in the last annual report, are herewith submitted.

The reports of Isaac Briggs, appointed by the members, ex-officio, in the recess of the board, to complete the surveys of the Roanoke, Dan, and Staunton rivers, and the river Potowmac, commenced by Mr. Moore, the late engineer of the board, but not finished at the time of his death, are communicated, for the information of the General Assembly.

All which is respectfully submitted.

JAMES PLEASANTS, Jr. *President.*

REPORT ON THE POTOWMAC,

BY ISAAC BRIGGS.

To the President and Directors of the Board of Public Works, of the Commonwealth of Virginia.

Gentlemen,

Pursuant to resolutions of the ex-officio members of your board, dated the 26th October, 1822, "empowering me to ask for and receive from the executors or heirs of Thomas Moore, the civil engineer lately deceased, all the rough notes of this year's work, as far as actually done, or begun by the said Moore, and" directing me "to make therefrom the necessary arrangements, calculations and statements for the annual report to the Board of Public Works, and to prepare and present to the said board, at the usual period, the said report;" and recognizing me as "the civil engineer of the State of Virginia," I proceeded forthwith, to the late residence of the deceased engineer, to obtain his notes. I received them from his son Asa. They were in pencil writing, and in that rough state in which they were first made at the places to which they relate. The last sickness of this excellent man so suddenly arrested his career of usefulness; and, from its first occurrence, so entirely incapacitated him for any kind of business, that it was not possible for him (as had been his custom,) to review his notes, improve their arrangement, supply abbreviations and casual omissions, and write them with ink.

I had received letters from most of the joint Potowmac commissioners, earnestly requesting that I would undertake to finish the survey of the Potowmac river, from the point where it had been suspended; to arrange the notes left by the late engineer; to make the necessary calculations, and form an estimate of the probable cost of an independent canal from Cumberland to tide-water; and that I would proceed to the work without delay.

Having found that the survey of the Potowmac could not be resumed until early in the 12th month, I employed the interval, preceding that time, in making the calculations and arrangements necessary for the estimates of expense as far as the work had proceeded. The late engineer had, from the 30th of the 7th, to the middle of the 9th month, brought the survey and levelling, about 157 miles. His own notes were continued no farther than to a point about 7 miles short of the termination of the levelling, or 150 miles from Cumberland.

In company with William Naylor, Moses T. Hunter, and Athanasius Fenwick, three of the commissioners (Asa Moore, jun. being surveyor and leveller,) I commenced on the 11th, and terminated on the 18th of the 12th month, just past, the survey and examination of the remaining part of the route of the contemplated canal. I closed the survey and examination at the head of the canal of Little Falls. This canal is about 2½ miles long. At its outlet, the descent is 37 feet, by 3 locks, to tide water in the District of Columbia.

From every document I have seen, and every thing I have heard, relating to the subject, it appears both the late engineer and the commissioners have completely abandoned the opinion that *stream navigation*, whether by *sluices* or by *dams and locks*, is in any degree eligible on the Potowmac, above tide-water. That opinion ought to be abandoned every where; and it will be abandoned; for, the increasing light of science, shining through the clear medium of experience, will convincingly show that, above tide-water, stream navigation is eligible *no where*. Those gentlemen, in designating the kind of improvement most proper for the Potowmac, have very wisely confined their views to an independent canal. The dimensions adopted, and those on which the calculations are made, are the following: The water to be 30 feet wide on the surface, 20 feet at bottom, and 3 feet deep.

It has been deemed expedient to divide into sections, the proposed canal, for the purpose of facilitating its execution. The *first* section extends from Cumberland, in Maryland, to the mouth of Capon, in Virginia, 54½ miles. The *second* section, from the mouth of Capon, to the mouth of Great Conogocheague, or Williamsport, in Maryland, 33½ miles. The *third* section, wholly on the Maryland side of the river, from the mouth of Great Conogocheague to Harper's ferry, opposite to the mouth of Shenandoah river, 38¾ miles. The *fourth* section, still on the Maryland side, from Harper's ferry to the head of the Great Falls, 40¼ miles. And the *fifth* section, still on the Maryland side, from the head of the Great Falls to tide-water, in the district of Columbia, 12 miles. The whole amount is 185 miles of canal navigation from Cumberland to tide-water.

In order to arrive at the greatest possible accuracy, in making the estimates of cost, the line has been taken in portions, sometimes minute, as the site has varied with respect to the difficulty or facility of, and of course the greater or less expense necessary for, constructing a good canal; and each portion has been calculated separately. We have assumed, for the various kinds of work, prices which have well sustained the test of experience; extensively in the State of New York, and in some measure in the State of Virginia. I, therefore, confidently believe, that if the execution of the work be faithfully and prudently managed, its cost will not exceed the estimate.

Between Cumberland and Williamsport, it is proposed, in order to avoid great difficulties, and to take advantage of the best and cheapest ground, that the navigation shall cross the Potowmac river four times; the two first crossings by means of dams, and the third and fourth by means of aqueducts. In every case, where a dam is the means of crossing, a guard lock is indispensable at the entrance of the canal where it proceeds again from the river on the opposite side. Aqueducts, however, as the mode of crossing rivers with a canal, are, on account of the superior safety and convenience which they afford to navigation, decidedly preferable to dams, although more expensive in construction; yet, where we cannot avail ourselves of sufficient feeders from side streams to keep always a full and certain supply of water in our upper levels, dams across the main stream are adopted, because by them we obtain an abundant supply without an additional cut for a feeder. This is precisely the case in the *first* crossing; and in the *second*, we have not a sufficient elevation for an aqueduct, to be safe from the effects of freshets.

I proceed now to the estimates of the probable cost necessary for constructing

AN INDEPENDENT CANAL ALONG THE VALLEY OF POTOWMAC RIVER, FROM CUMBERLAND TO TIDE-WATER—185 MILES.

For the first 150 miles, the rough notes of the late engineer are the basis and elements of these estimates. I have arranged the items in their proper order, supplied abbreviations, and made all the calculations. The next 7 miles were estimated from information given by him during his last sickness; and the last 28 miles, from my own notes.

The first level was commenced at the smooth water below the mouth of Wills's creek; from whence, to a point just below the rocky bank, opposite Beall's island, and just above a shoal, the fall is 4.54 feet, where a very small bench mark is made on the lower side of a small sycamore, 6 feet above the present water. It is believed, that a dam raised to this height will give navigable water at all times to Cumberland.

The length of a dam across this arm of the river to a large oak tree, is about 60 yards, and it is supposed the other arm is rather wider, say 70 yards.

These two dams, with 4 abutments, may be estimated to cost	$ 3,000 00
A wooden lock,	1,000 00
Taking the bench mark already mentioned, for our surface line, we proceeded on an experimental line for an independent canal; agreeably to the leveller's notes, from beginning to end of second station, the distance is 13¼ perches. The average depth of cutting may be assumed 8 feet, and the price 14 cts. per cubic yard.	
2,159 cubic yards, at 14 cents, is	302 00
From the end of No. 2, to the end of No. 6, the distance is 71½ perches; the average depth of cutting will be 10½ feet, and the price 12½ cents per cubic yard.	
17,205 cubic yards at 12½ cents, is	2,151 00
From the end of No. 6, to the end of No. 18, the average depth of cutting will be 5.20 feet of easy excavation, except that a part of it is wood land, which will increase the labor. The whole may be estimated at 13 cents per cubic yard; but it is ascertained, that this is not the ground for the canal. In order to save a little distance, a course was taken from No. 7, which led into deep cutting; and it appears that less than 20 perches from the end of No. 7, in the same ravine, would have brought us to ground of excellent quality, where we might have chosen our depth, but would have increased the distance. I am, therefore, of the opinion, that by allowing an increase of distance of 20 perches, it may be thus estimated:	
Carried forward—84¾ perches, cost	$ 6,453 00

Brought forward—84¾ perches, cost	$ 6,453 00
From the end of No. 6, 45 perches, averaging 5.20 feet depth of cutting, at 12½ cents per cubic yard, and thence to the end of No. 18, 329 perches, averaging 3 feet depth of cutting, at 10 cents per cubic yard. From No. 6 to 18, this makes the distance 374 perches, which is 20 perches more than the line measured.	
4,100 cubic yards, at 12½ cents, is	512 00
15,070 do. do. 10 do.	1,508 00
From 18* to 24, the distance is 241 perches, the average depth of cutting is 3 feet, and the price 10 cents per cubic yard.	
11,046 cubic yards, at 10 cents,	1,105 00
From 24 to 28, the distance is 61½ perches. The average depth of cutting is 4 feet, and the price 12½ cents per cubic yard.	
4,010 cubic yards, at 12½ cents,	501 00
Station No. 28, ends near the river, just at the end of the hill, one perch below where a small culvert must be built, and may cost	100 00
From 28 to 30, the distance 27¾ perches, along a steep hill side. The average depth of cutting may be equal to 5 feet, and the price 12½ cents per cubic yard.	
2,402 cubic yards, at 12½ cents,	300 00
From 30 to 38, the distance is 101¾ perches, along a rocky, precipitous bank, which will require a wall 22 feet high. The stone will probably be had on the spot, and stuff for filling in and lining convenient.	
22 feet walling†; 101¾ perches, at $ 100,	10,175 00
From 38 to 39, the distance is 2 perches. The depth of cutting may average 3 feet, and the price 12½ cents per cubic yard.	
92 cubic yards, at 12½ cents,	12 00
From 39 to 42, and 6 perches, the distance is 61 perches, to Evett's creek, where will be	
Carried forward—2 m. 313¾ perches, cost	$ 20,666 00

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* Henceforward, figures simply will be used to designate the numbers of the stations, always meaning the *end* of the distance belonging to each station mentioned.

† The term "walling," is intended to include, with the masonry, the *filling in, and lining*.

Brought forward—2 m. 313¾ perches, cost	$ 20,666	00
necessary. 45 perches of embankment, equal to 3½ feet depth of cutting, at 12½ cents per cubic yard, and an aqueduct 21 feet high, and 100 feet long.		
3,039 cubic yards of embankment, at 12½ cents,	380	00
An aqueduct over Evett's creek,	4,000	00
From 42 and 6 perches to 51, the distance is 141¾ perches. The depth of cutting will average 12 feet, to keep quite clear of the river bank ; but, taking all advantages of ravines, and in places where the bank is sloping, keeping below the top, may, I believe, reduce it to 10 feet : 15 cents per cubic yard will be a fair price.		
31,763 cubic yards, at 15 cents,	4,764	0
From 51 to 58, the distance is 134 perches. The depth of cutting may average 7 feet, and the price 15 cents per cubic yard. In this section, a culvert will be necessary.		
18,152 cubic yards, at 15 cents,	2,723	00
A culvert,	150	00
From 58 to 60, the distance is 18 perches, along a rocky bank, which will require a wall 20 feet high. It is uncertain whether enough of suitable stone is on the spot.		
20 feet walling, 18 perches, at $ 95,	1,710	00
From 60 to 72, the distance is 134 perches, an uneven hill side. The cost will be equal to an average depth of 6 feet, at 15 cents per cubic yard. A small culvert, and one tolerably large, will be necessary.		
14,740 cubic yards, at 15 cents,	2,211	00
A small culvert,	100	00
A large do.	200	00
From 72 to 77, the distance is 84 perches, along ground where the depth may be chosen ; but, for a considerable part of it, the canal line is along a steep little slope that divides a first and second bottom. The average depth of cutting may be stated at 4 feet, and the price at 12½ cents per cubic yard.		
5,476 cubic yards, at 12½ cents,	684	00
Carried forward—4 m. 185½ perches, cost	$ 37,588	00

Brought forward—4 m. 185¾ perches, cost	$ 37,588 00
From 77 to 104, through D. Cokely's meadow and flat piece of woodland to Burbridge's tobacco ground; so far the depth may be every where taken. From near the upper end of this ground, an experimental line was run to a low place on a ridge, to the left of the line where it was contemplated to take the canal; but it was found to require very deep cutting for a considerable distance; at the top 50 feet. Then continued through flat ground, mostly woods, to the crossing (in Vanmeter's field,) of the ridge which makes down in this bend of the river. In order to favor the crossing the low gap before-mentioned, we bore too much to the left in ground which required deep cutting: but, it is now quite certain, that had we continued on the proper ground, our distance from Cokely's to this point, the end of No. 104, would have been shorter than that on the line we traced, with choice of depth. The distance may be stated 562¾ perches; the average depth of cutting three feet, and the price 12½ cents per cubic yard.	
25,793 cubic yards, at 12½ cents,	3,224 00
From 104 to 118, the distance is 350½ perches, (to Vanmeter's house,) along a hill side, in some places rather steep. The average depth of cutting will be 4 feet, and the price 12½ cents per cubic yard.	
22,847 cubic yards, at 12½ cents,	2,856 00
From 118 to 131, the distance is 285 perches, on excellent ground. The average depth of cutting may be stated at 3 feet, and the price 10 cents per cubic yard.	
13,062 cubic yards, at 10 cents,	1,306 00
Station 131, ends at the edge of a ravine near the road just above the narrows, where it is proposed to descend 30 feet, by 4 locks; leaving our next level 17.90 feet above the river.	
From 131 to 137, the distance is 176 perches: 30 perches of this will be occupied	
Carried forward—8 m. 279¼ perches, cost	$

Brought forward—8 m. 279¼ perches, cost	$ 44,974 00
by the 4 locks mentioned above; the remaining 146 perches, may be estimated at $ 40 per perch in length; 140 perches at $ 40, is	5,840 00
From 137 to 145 and 6 perches, the distance is 108 perches, requiring a wall averaging 7 feet high. The foundation is excellent, and on the spot is plenty of stone and stuff for filling in and lining. This will elevate the surface of the canal, nearly 18 feet above the present water, making with the towing path nearly 20 feet, which is said to be higher than the water rises at this place.	
7 feet walling 108 perches, at $ 30,	3,240 00
From 145 and 6 perches to 151, the distance is 200 perches along a hill side, stony in some places. The average depth of cutting, will be 4 feet, and the price may be stated at 16 cents per cubic yard.	
13,037 cubic yards, at 16 cents,	2,086 00
From 151 to 158, the distance is 235½ perches. The average depth of cutting will be 3 ft. and the price 12½ cts. per cubic yard.	
10,771 cubic yards, at 12½ cents,	1,346 00
From 158 to 159, the distance is 14 perches. The average depth of cutting will be 4 feet, and the price 25 cents per cubic yard.	
913 cubic yards at 25 cents,	228 00
Near No. 159, we descend 9 feet by 1 lock.	
From 159 to 168, the distance is 200½ perches, to a rocky point, along good ground. The average cutting will be 3 feet deep, and the price 12½ cents per cubic yard.	
9,190 cubic yards, at 12½ cents,	1,149 00
From 168 to 171, the distance is 26 perches; requiring a wall averaging 13 feet high.	
13 feet walling, 26 perches, at $ 60,	1,560 00
From 171 to 172, the distance is 12 perches: requiring a wall averaging 8 feet high.	
8 feet walling, 12 perches, at $ 35,	420 00
From 172 to 173, the distance is 12 perches; through some large detached rocks.	
Carried forward—11 m. 115¾ perches, cost	$ 60,843 00

Brought forward—11 m. 115¼ perches, cost	$ 60,843 00
The average depth of cutting will be 4 feet, and the price 30 cents per cubic yard.	
782 cubic yards, at 30 cents,	235 00
From 173 to 179, the distance is 158 perches, through bottom land. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
7,242 cubic yards, at 12½ cents,	905 00
From 179 to 184, the distance is 136 perches; in which there will be necessary, some embankment, some expensive cutting, and a culvert to pass Sap's Run. The depth of cutting, may be averaged at 6 feet, and the price at 20 cents per cubic yard.	
14,960 cubic yards, at 20 cents,	2,992 00
A culvert over Sap's Run,	200 00
From 184 to 190, the distance is 43 perches, requiring a wall averaging 20 feet high. Stone is not so convenient here as in many other places; but it is believed enough may be had, without the necessity of removing any part of them more than 20 yards. Stuff for filling in and lining, is every where at hand.	
20 feet walling 43 perches, at $ 95,	4,085 00
From 190 to 194, the distance is 58 perches; along a very steep slaty hill side, where the cost of making a good canal will probably be equal to $ 25 per perch, lineal measure.	
58 perches at $ 25,	1,450 00
From 194 to 203, the distance is 149 perches, along the edge of a steep bank. The average depth of cutting will be 6 feet, and the price 12½ cents per cubic yard.	
16,390 cubic yards, at 12½ cents,	2,049 00
From 203 to 227, the distance is 788 perches, on good ground, where the depth may be chosen, but, in some places, it is a little waving. The average depth of cutting may be stated 3½ feet, and the price 12½ cts. per cubic yard.	
43,541 cubic yards, at 12½ cents,	5,443 00
Carried forward—15 m. 179¼ perches, cost	$ 78,202 00

Brought forward—15 m. 179¼ perches, cost $78,202 00

From 227 to 234, the distance is 154½ perches along an open hill side, easy to excavate, but in one or two spots, bad to hold water. The average depth of cutting may be stated 5 feet, and the price 12½ cents per cubic yard, which will include an allowance for a little puddling, if necessary, a culvert and some embankment.

13,376 cubic yards, at 12½ cents, 1,672 00

On a retrospect of our line of canal, as far as this place, No. 234, it is my opinion, that most of the expense of walling, &c. at the cliffs, might be avoided by four crossings of the river. One at the head of Swan ponds, and re-crossing below, at or near the island below Burbridge's ford; this would allow descending by a lock at the foot of the Swan ponds, and passing out 200 or 300 yards below, then crossing again just below Patterson's creek ridge, and re-crossing, by damming on both sides of an island opposite to a cliff on the Virginia side, and passing out at the head of the fall opposite to the island, and continuing to this place. Although no doubt remains that the cost of the canal would be considerably diminished by these crossings, and the navigation, perhaps, be as safe and convenient, yet the estimates on the line traced, are retained as the most expensive branch of the alternative.

From 234 to 280, the distance is 960 perches, (3 miles) on the Maryland side of the river, and passing Cresap's landing. These three miles, as we have traced the line, present great difficulties, which can be overcome only by great expense. There will be necessary, a considerable proportion of high walling, where materials suitable for good work are scarce. Here the estimates have been formed, as usual, from separate calculations of sundry pieces, as the character of the ground has varied; the amount is 27,432 00

It seems expedient to locate, in the space of three miles, two locks, one of ten feet lift

arried forward—19 m. 13¾ perches, cost $107,306 00

Brought forward—19 m. 13¾ perches, cost $107,306 00

near the beginning, and the other of eight feet lift near the end.

It is my opinion, that it will not be safe to depend on the first supply of water for the canal, further than to J. Cresap's landing, or to No. 234, (16 miles,) and there is no certainty of obtaining any important feeder, from a side stream or streams, above that place. I think it would be right to erect a dam on a proper site, about the head of the fall just above the said landing, then descend by locks into the river, and take the canal out on the opposite or Virginia side, where the ground is good, to a rocky point just above the mouth of South Branch. This plan will afford a full supply of water, and avoid all the very expensive ground already mentioned below Cresap's landing. About a quarter of a mile below the mouth of South Branch, there is an excellent ledge of rocks for the foundation of a dam, which may be raised conveniently eight feet high, and as there is scarcely any fall for a long distance above, we may descend, by a lock, into the river, short of the rocky point above the mouth of South Branch, and cross over to a suitable place of taking out on the Maryland shore, where, with but little deep cutting, we may reach ground where the depth may be chosen. The South Branch trade will thus come into the canal.

To remove all cause of doubt of the adequacy of our estimates to accomplish the proposed object, we have in the last item also retained the most expensive branch of the alternative.

From 280 to 304, the distance is 888 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

40,700 cubic yards, at 12½ cents, 5,087 00

From 304 to 312, the distance is 269 perches, commencing at the western edge of

Carried forward—22 m. 210¾ perches, cost [illegible] 00

Brought forward—22 m. 210¾ perches, cost	$ 112,393 00

Town creek, across which will be necessary an aqueduct 5 perches long and 20 feet high. Then for 7 perches the average depth of cutting will be 3 feet; then there must be a culvert to discharge the water from Oliver Cromwell's mill; then 27 perches of embankment, averaging 6 feet high, to a point opposite to Cromwell's house; and for the remainder of this section, the average depth of cutting will be 3 feet. The whole, from the east end of the aqueduct, including the embankment and culvert, may be stated as equal to 3½ feet depth of cutting at 12½ cents per cubic yard.

An aqueduct over Town creek,	3,500 00
14,587 cubic yards, at 12½ cents,	1,823 00

From 312 to 313, the distance is 16 perches. The first seven perches will be occupied by a lock of 9 feet lift. For the remainder, the depth of cutting will average 4 feet, and the price 14 cents per cubic yard.

587 cubic yards, at 14 cents,	82 00

From 313 to 318, the distance is 98 perches, requiring a wall averaging 12 feet high. For this wall, there is a foundation of rock, and plenty of materials are at hand.

12 feet walling, 98 perches, at $ 55,	5,390 00

From 318 to 323 and 4 perches, the distance is 134 perches, along a rough hill side. The depth of cutting will average 5 feet, and the price 15 cents per cubic yard.

11,601 cubic yards, at 15 cents,	1,740 00

From 323 and 4 perches, to 327, the distance is 104 perches, requiring a wall averaging 14 feet high.

14 feet walling, 104 perches, at $ 65,	6,760 00

From 327 to 330, the distance is sixty perches, along a rough hill side. The average depth of cutting will be 5 feet, and the price 15 cents per cubic yard.

5,194 cubic yards, at 15 cents,	779 00

From 330 to 334, the distance is 122 perches, on good ground. The average depth

forward—24 m. 104¾ perches, cost	$ 132,4

Brought forward—24 m. 104¾ perches, cost	$ 132,467 00
of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
5,592 cubic yards, at 12½ cents,	699 00
From 334 to 335, the distance is 22 perches, along a very rough hill side. The average depth of cutting will be 6 feet, and the price 20 cents per cubic yard.	
2,420 cubic yards, at 20 cents,	484 00
From 335 to 336, the distance is twenty perches, requiring a wall averaging 14 feet high; 14 feet walling 20 perches, at $ 65,	1,300 00
From 336 to 339, the distance is 48 perches, along a rough slate hill side. The average depth of cutting will be 4 feet, and the price 25 cents per cubic yard.	
2,129 cubic yards, at 25 cents,	782 00
From 339 to 344, the distance is 110 perches, requiring a wall averaging 16 feet high. Materials are at hand.	
16 feet walling, 110 perches, at $ 75,	8,250 00
From 344 to 346, the distance is 54 perches. For the first 40 perches of this section, the average depth of cutting will be 4 feet, and the price 14 cents per cubic yard; and, for the remaining 14 perches, there will be necessary, a wall averaging 12 feet high.	
2,607 cubic yards, at 14 cents,	365 00
12 feet walling, 14 perches, at $ 55,	770 00
From 346 to 370, the distance is 695½ perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
31,877 cubic yards, at 12½ cents,	3,985 00
Near No. 370, we descend 14 feet, by 2 locks. Our surface level will then be 19.55 feet above the present water.	
From 370 to 375 and 18 perches, the distance is 162 perches. For the first 32 perches of this section, the average depth of cutting will be 5 feet, and the price 14 cents per cubic yard. The remaining 130 perches will require a wall, averaging 12 feet high. [illegible]ty of materials at hand.	
[illegible]rd—27 m. 256¼ perches, cost	$ 149,102 00

Brought forward—27 m. 256¾ perches, cost	$ 149,102 00
2,770 cubic yards, at 14 cents,	388 00
12 feet walling, 130 perches, at $ 55,	7,150 00

By crossing over to the Virginia side, about No. 312, and re-crossing probably about No. 360, above a bluff on the Virginia shore, some expense would be saved.

From 375 and 18 perches, the distance is 230½ perches, on good ground, except a little gravelly for a short space. The average depth of cutting will be 3 feet, and the price 13 cents per cubic yard.

10,565 cubic yards, at 13 cents,	1,373 00

From No. 385, we cross the river, either by means of an aqueduct, 30 perches long, and 22½ feet high, or by means of a dam descending into the smooth water by locks, and passing out on the other side of the river. In order to have sufficient elevation for an aqueduct, safe from the effects of freshets, we must keep a higher level where the last descent was noted. This, by requiring the last walling to be higher, would increase the expense of that section.

An aqueduct over the Potowmac river,	10,000 00
Increased expense of the section above,	3,900 00

From 385 on the Maryland side, to 387 on the Virginia side, the distance is 30 perches, occupied by the aqueduct just mentioned.

From 387 to 416, the distance is 635 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

29,104 cubic yards, at 12½ cents,	3,638 00

Near No. 416, descend 9 feet, by one lock.

From 416 to 425, the distance is 226 perches, requiring a wall averaging 11 feet high. Good stone in abundance; but, probably, in some places, a little scarcity of earth.

11 feet walling, 226 perches, at $ 50,	11,300 00

From 425 to 440, the distance is 353½ perches, on good ground. The average

ed forward—32 m. 131¾ perches, cost	$ 186,851 00

Brought forward—32 m. 131¼ perches, cost	$ 186,851 00
depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
16,202 cubic yards, at 12½ cents,	2,025 00
Near No. 440, we descend 8 feet by one lock. This brings our surface level to 19.49 feet above the present water.	
From 440 to 452, the distance is 268 perches, along a very rough, and mostly steep hill side. It is probable a little walling, in some places, will be necessary. I think an average of $ 24 per perch, lineal measure, will be a sufficient allowance.	
268 perches, at $ 24,	6,432 00
From 452 to 455, the distance is 43 perches. The average depth of cutting will be 3½ feet, and the price 14 cents per cubic yard.	
2,376 cubic yards, at 14 cents,	333 00
From 455 to 475 and 16 perches, the distance is 460 perches. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
21,083 cubic yards, at 12½ cents,	2,635 00
From 475 and 16 perches, to 478 and 6 perches, the distance is 48 perches, along a very steep hill side, where a little walling may be necessary, in one or two places. The whole may be rated at $ 25 per perch, running measure.	
48 perches, at $ 25,	1,200 00
From 478 and 6 perches to 520, the distance is 1,204 perches; mostly on a gentle slope of excellent ground for canalling. There are, however, a few places that are a little steep. The whole may average 3 feet depth of cutting, and 12½ cents per cubic yard will be a fair price.	
55,183 cubic yards at 12½ cents,	6,898 00
Near No. 520, we descend 16 feet, by 2 locks, leaving our next level 20.06 feet above the river.	
From 520 to 5[illegible] distance is 51 perches. The avera[illegible] of cutting will be 4 feet, and the pr[illegible] cubic yard.	
Carried forwa[illegible]es, cost	$ 206,374 00

Brought forward—38 m. 285¼ perches, cost	$ 206,374 00
3,324 cubic yards, at 15 cents,	499 00
From 523 to 533, the distance is 302 perches, along the river bank, where it continues steep for some height above our level. The average depth of cutting would probably not exceed 5 feet, nor the price 12½ cents per cubic yard; but, as in one or two places, a little walling may be necessary, and as it will be proper to reserve all the stone to be laid on the outside of the bank to prevent its washing by freshets, we will estimate the whole at $ 12 per perch in length.	
302 perches, at $ 12,	3,624 00
It will, perhaps, be best to keep a higher level as far as to No. 533, as there is a bench, favorable for the purpose, most of the way.	
From 533 to 540, the distance is 150 perches. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
6,875 cubic yards, at 15 cents,	1,031 00
From 540 to 553, the distance is 376 perches, along the western foot of Sidling Hill. Some part of this distance will not require a wall, but the greater part will require one 11 feet high, and there are a few places where one at least 20 feet high will be necessary. I think the whole will average 12 feet high. There is stone at hand, mostly very good, except a little near the lower end.	
12 feet walling, 376 perches, at $ 55,	20,680 00
From 553 to 561, the distance is 136 perches, on tolerable good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
6,233 cubic yards, at 12½ cents,	779 00
From 561 to 564, the distance is 94 perches, on tolerable good ground. The average cutting will be 3 feet, and the price 14 cents per cubic yard.	
4,308 cubic yards, at 14 cents,	603 00
Near No. 561, we descend 8 feet by one lock,	
Carried forward—42 m. 63¾ perches, cost	$ 233,490 00

Brought forward—42 m. 63¾ perches, cost	$ 233,490 00
From 564 to 566 and 12 perches, the distance is 56 perches. There will be some embankment on the lower side, in crossing a small ravine twice. The cost of making this section will probably be equal to $ 16 per perch in length.	
56 perches, at $ 16,	896 00
From 566 and 12 perches, to 568 and 6 perches, the distance is 32 perches. The average depth of cutting will be 3 feet, and the price 20 cents per cubic yard.	
1,466 cubic yards, at 20 cents,	293 00
From 568 and 6 perches, to 569 and 16 perches, the distance is 28 perches, along the river bank ; a slate rock, where will be necessary a wall, averaging 18 feet high. Stône is not so convenient as usual. The masonry will probably cost $ 1¼ per perch.	
18 feet walling, 28 perches, at $ 98,	2,744 00
From 569 and 16 perches, to 571 and 22 perches, the distance is 68 perches. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
4,433 cubic yards, at 16 cents,	665 00
From 571 and 22 perches, to 573 and 11 perches, the distance is 85½ perches, along a very rough, slaty hill side. In some places, a wall will be necessary ; and, where not necessary, the excavation will be expensive. The whole may average $ 25 per perch in length.	
85½ perches, at $ 25,	2,137 00
From 573 and 11 perches, to 580, the distance is 217 perches, on ground affording the cheapest kind of excavation. It appears that the line may be shortened by encountering a little deeper cutting near the beginning of this section, and keeping close to the hill, on excellent ground. The average depth of cutting may be stated 3 feet, and the price 10 cents per cubic yard.	
9,946 cubic yards, at 10 cents,	995 00
From 580 to 612, the distance is 1,092½ perches, on very good ground, with a few	
Carried forward—47 m. 42¾ perches, cost	$ 241,220 00

Brought forward—47 m. 42¾ perches, cost $241,220 00

trifling exceptions. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

50,073 cubic yards, at 12½ cents, . 6,259 00

Near No. 612, we descend 8 feet by one lock, leaving our next level 20.30 feet above the river.

From 612 to 615, the distance is 72 perches, along a steep, stony hill side, where, although walling will not be necessary, the excavation will be expensive, and may be stated $ 15 per perch in length.

72 perches, at $ 15, 1,080 00

From 615 to 619, the distance is 86 perches, along the same hill side as the last section, but on much better ground. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.

5,606 cubic yards, at 15 cents, 841 00

From 619 to 639, the distance is 614 perches, on excellent ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

28,142 cubic yards, at 12½ cents, . 3,518 00

From 639 to 648, the distance is 216 perches, on nearly the same kind of ground as the last section, but in the woods. The average depth of cutting may be stated 3 feet, and the price 15 cents per cubic yard.

9,900 cubic yards, at 15 cents, 1,485 00

Near No. 648, we descend 10 feet by one lock, leaving our next level 21.23 feet above the river.

From 648 to 652, the distance is 50 perches, along a rough hill side. The average depth of cutting will be 4 feet, and the price 20 cents per cubic yard.

3,259 cubic yards at 20 cents, 652 00

From 652 to 657, the distance is 130 perches, requiring a wall; a considerable part of which need not be more than from 6 to 8 feet high, but toward the lower end it will be much higher. I think it will be quite safe to

Carried forward—50 m. 250¾ perches, cost $ 255,055 00

Brought forward—50 m. 250¾ perches, cost	$ 255,055 00
assume an average height of 11 feet for the whole.	
11 feet walling, 130 perches, at $ 50,	6,500 00
There is stone in abundance at hand for the last mentioned wall; but there may be a scarcity of earth for filling in and lining.	
From 657 to 660, the distance is 86 perches, on good ground, in the woods. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
3,942 cubic yards at 15 cents,	591 00
From 660 to 671, the distance is 367 perches, through cleared and good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
16,821 cubic yards at 12½ cents,	2,103 00
From 671 to 677, the distance is 102 perches, along the end of Sidling hill, very steep and rugged. I believe the canal may be made here, with but very little, perhaps without any, walling; but it being a level about 27 feet above the river, the excavation will be expensive. I suppose the cost will be about $ 30 per perch in length.	
102 perches, at $ 30,	3,060 00
From 677 to 679 and 8 perches, the distance is 34 perches, still along the hill. The average depth of cutting will be 5 feet, and the price 15 cents per cubic yard.	
2,944 cubic yards, at 15 cents,	442 00
From 679 and 8 perches to 689, the distance is 357½ perches. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
23,304 cubic yards, at 15 cents,	3,496 00
From 689 to 709, the distance is 232 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
10,633 cubic yards, at 12½ cents,	1,329 00
No. 709, is at the mouth of Capon on its western bank, and terminates the first section of the canal. Probably it will be found	
Carried forward—54 m. 149¼ perches, cost	$ 272,676 00

Brought forward—54 m. 149¼ perches, cost expedient to descend 7 feet by one lock, near No. 670. Our level would then be at the lower end of this section, 30 feet above the surface of Potowmac river.	$ 272,676 00
Distance 54 m. 149¼ perches, cost	$ 272,676 00

SUMMARY

Of the estimates of expense, necessary for constructing the first section of the proposed canal, commencing at Cumberland in Maryland, and terminating at the mouth of Capon in Virginia, 54½ miles.

For excavation, walling, aqueducts, dams, &c., including 6 culverts specially noted by the engineer,	$ 272,676 00
For lockage, 146 feet (in 18 locks,) at $ 650 per foot lift,	94,900 00
48 culverts, (noted by the leveller in addition to those mentioned in the first item,) at $ 200 each,	9,600 00
30 farm bridges, at $ 300 each,	9,000 00
4 road bridges, 500 "	2,000 00
	$ 388,176 00
Add for contingencies, engineers, superintendence, &c., 10 per cent.	38,818 00
Amount of estimates for the 1st section, being $ 7,835 per mile, which in proportion for a canal of the same dimensions as those in the State of New York, 40 feet wide and 4 feet deep, would be $ 14,207 per mile.	
	$ 426,994 00

SECOND SECTION

Commences at the same point where the first terminates, at station No. 709, (of the leveller's notes,) on the western bank of Capon, near its mouth.

Before we proceed to the estimates, it will be proper to remark, that crossing the Potowmac, a survey and examination were made on the Maryland side, for a distance of 8 5-8 miles from the mouth of Capon, and after careful calculations in the usual *detailed mode*, the amount of estimates (exclusive of lockage, culverts and bridges,) was $ 73,000. This result not being satisfactory, it was determined to return to the mouth of Capon, in order to see whether it was practicable and more eligible to continue on the Virginia side, taking in Capon as a feeder. Accordingly, (8 mo. 19, 1822,) two of the commissioners and I, returned this morning to make the examination. Two plans came under consideration: *one*, to descend by locks on the west side of Capon, about 15 feet, leaving the surface of the canal about 22 feet above the present water in the Potowmac, and run the canal up the Capon, 300 to 350 yards, to a suitable point for descending into that stream, which will probably be just above an old saw-mill, a little below which there is an excellent site for a dam. If at this place a dam were erected 9 feet high, this elevation, added to about 6 feet fall between the dam and the Potowmac, would give 15 feet elevation for the surface of the water raised by the dam. The seven feet between this and the level of the canal last mentioned, would be overcome by one lock; then, crossing over Capon, enter the bank on the eastern side, with about seven feet cutting, which would run out to three feet in about one mile.

The *other* plan is, to continue our upper level to a high ledge of rocks on the west bank of Capon, and from that point, cross it on an aqueduct to be composed of a wooden superstructure, supported by stone abutments and piers. The bank where the east end of this aqueduct would be, is much lower than the level before-mentioned, and therefore would require an embankment for a short distance, to a safe place for a lock to descend to such a level, as will admit of easy cutting. To this last mentioned level, it is proposed to bring on the Capon as a feeder, by taking it out at a suitable elevation some where above the bridge, which feeder must be sufficiently large to admit the trade of Capon to pass into the main canal.

The latter plan was adopted *for trial*, and afterward *confirmed*, when we found a good canal could be made on the Virginia side, 8¾ miles for $ 50,000, (exclusive of lockage, culverts and bridges,) and considered that the estimated cost of 8 5-8 miles on the Maryland side, was $ 73,000.

From 709 to 711, the distance is 43½ perches across Capon; occupied by an aqueduct and its abutments. The late engineer has stated the cost of this aqueduct, at	4,000 00
Near 711, we descend 6 feet by one lock.	
From 711 to 726, the distance is 388 perches. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
19,754 cubic yards, at 12½ cents,	2,469 00
From 726 to 727, the distance is 10 perches. The average depth of cutting will be 5 feet, and the price 14 cents per cubic yard.	
866 cubic yards, at 14 cents,	121 00
From 727 to 729 and 10 perches, the distance is 52 perches, requiring a wall averaging 12 feet high; also extra work in cutting through a point of rocks, called "The Philadelphia rock."	
12 feet walling, 52 perches, at $ 55,	2,860 00
Extra, for Philadelphia rock,	150 00
From 729 and 10 perches to 747, the distance is 424 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
19,433 cubic yards, at 12½ cents,	2,429 00
From 747 to 752 and 18 perches, the distance is 172 perches, along the foot of a steep rocky hill, requiring a wall averaging 16 feet high.	
16 feet walling 172 perches, at $ 75,	12,900 00
From 752 and 18 perches to 755, the distance is 46 perches. For the first 18 perches, the average depth of cutting will be 5 feet, and the price 20 cents; and for the remaining 28 perches, the average depth of cutting will be 4 feet, and the price 12½ cents per cubic yard.	
1,558 cubic yards, at 20 cents,	312 00
1,825 do. do. 12½ do.	228 00
From 755 to 769 and 18 perches, the distance is 456 perches. The average depth of	
arried forward—4 m. 311½ perches, cost	$ 25,469 00

Brought forward—4 m. 311½ perches, cost	$ 25,469 00
cutting will be 3 feet, and the price 12½ cents per cubic yard.	
20,900 cubic yards, at 12½ cents,	2,613 00
Near No. 770, we descend 14 feet by two locks, leaving our next level 21 feet above the river.	
From 769 and 18 perches to 772, the distance is 82 perches, along a high steep rock, requiring a wall averaging 18 feet high.	
18 feet walling, 82 perches, at $ 85,	6,970 00
From 772 to 773 and 3 perches, the distance is 15 perches, through very rocky and stony ground.	
The cost may be stated $ 30 per perch in length.	
15 perches, at $ 30,	450 00
From 773 and 3 perches to 794, the distance is 680 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
31,167 cubic yards, at 12½ cents,	3,896 00
From 794 to 795 and 26 perches, the distance is 68 perches. For the first 32 perches the excavating will be rough, the cost may be stated at $ 20 per perch in length; and for the remaining 36 perches, a wall averaging 20 feet high will be necessary.	
Excavation, 32 perches, at $ 20,	640 00
20 feet walling, 36 perches, at $ 95,	3,420 00
From 795 and 26 perches to 797 and 10 perches, the distance is 56 perches, rough excavating, and occasionally a little walling. The cost may be stated $ 22 per perch in length.	
56 perches at $ 22,	1,232 00
From 797 and 10 perches to 813, the distance is 334 perches. For the first 312 perches, along a narrow bottom, at the foot of a hill, stony in some places, the average depth of cutting will be 4 feet, and the price 16 cents per cubic yard; and for the remaining 22 perches, a wall averaging 20 feet high will be necessary.	
Carried forward—8 m. 266½ perches, cost,	$ 44,690

Brought forward—8 m. 266½ perches, cost	$ 44,690 00
20,338 cubic yards, at 16 cents,	3,254 00
20 feet walling 22 perches, at $ 95,	2,090 00
From 813 to 823, the distance is 241¼ perches along good ground. At the commencement, the depth of cutting will be 8 feet for a little way, then moderate. The average depth of cutting will be 4 feet, and the price 12½ cents per cubic yard.	
15,710 cubic yards, at 12½ cents,	1,964 00
From 823 to 864, the distance is 1394 perches. In this section there must be an embankment across the Warm Spring run, (which must be taken into the canal for a feeder,) about 15 perches long, and 8 feet high: then on good ground, except a little waving, and some pieces of embankments, which will cost but little more than excavation. For the whole, the average depth of cutting may be stated 3½ feet and the price 12½ cents per cubic yard.	
77,025 cubic yards, at 12½ cents,	9,628 00
From 864 to 867, the distance is 35 perches, across Potowmac river to the Maryland side, to be occupied by an aqueduct in which the surface of the canal will be 33.57 feet above that of the river at present. Some embankment will be necessary at the southern end of the aqueduct, and may cost	300 00
The cost of the aqueduct over Potowmac, will probably be about	12,000 00
At the north end of the aqueduct, in Maryland, we descend 6 feet by one lock, leaving our next level 27.57 feet above the river.	
From 867 to 872, the distance is 224½ perches, crossing Dr. Jacques's low ground obliquely to the turnpike road, just below which is No. 872. The average depth of cutting may be stated 3½ feet, and the price 12½ cents per cubic yard.	
12,405 cubic yards, at 12½ cents,	1,551 00
From 872 to 875, the distance is 94 perches, along Mill Stone Point, requiring a wall averaging 16 feet high.	
Carried forward—12 m. 268½ perches, cost	$ 75,477 00

Brought forward—12 m. 268½ perches, cost	$75,477	00
16 feet walling 94 perches, at $ 75,	7,050	00
From 875 to 892, the distance is 722 perches, to the bank of Licking creek; the ground is good. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.		
33,092 cubic yards, at 12½ cents,	4,136	00
We propose to cross Licking creek on an aqueduct, about 6 perches long, and 32 feet high; which will probably cost about	3,000	00
At the eastern end of the aqueduct, we descend 8 feet by one lock, leaving our next level 24.54 feet above the present water in the creek.		
It is intended to bring this creek into the canal, for a feeder, by taking it out about 2 miles above the aqueduct, and delivering it in below the lock.		
From 892 and 6 perches to 962, the distance is 1831¾ perches, on good ground; the depth of cutting, every where at our command, average 3 feet; the price 12½ cents per cubic yard.		
83,955 cubic yards, at 12½ cents,	10,494	00
At No. 962, we cross the Green Spring run, and take it into the canal by embankment. This stream is not large, but will be quite useful in dry seasons, especially, as a reservoir will be formed above the canal; and it is believed several may be formed in other places.		
From 962 to 964, the distance is 30 perches, on ground a little uneven, and one point of rocks to be excavated. For the whole, the average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard: and for extra work,	172	00
1,375 cubic yards, at 12½ cents,	250	00
From 964 to 974, the distance is 214 perches, along a slope in some places uneven, with some rocks. The average depth of cutting will be 4 feet, and the price 16 cents per cubic yard.		
Carried forward—21 m. 186¼ perches, cost	$ 100,579	00

Brought forward—21 m. 186¼ perches, cost	$ 100.579 00
13.950 cubic yards, at 16 cents,	2,232 00
From 974 to 979, the distance is 80 perches, along a very rocky hill side, where, although little or no walling will be required, the excavation will be very expensive. The cost may be stated $ 26 per perch in length.	
80 perches, at $ 26,	2,080 00
From 979 to 986, the distance is 163 perches, across a neck of land to —— Prather's, by which route 3 to 4 miles of distance will be saved, about two miles of which is of the most expensive kind. But in crossing this neck, some deep cutting must be encountered, which may be stated as follows: 83 perches bring us to the top of the ridge, and 80 perches more, to the end of the deep cutting. For the whole, the average depth of cutting will be 17 feet, and the price 15 cents per cubic yard, provided there should be no rock. The ground looks favourable, but if rock should occur, the expense may be greater.	
81,847 cubic yards, at 15 cents,	12,277 00
From 986 to 988, the distance is 44 perches, which will probably be occupied by 4 locks of 7½ feet lift each, in the whole a descent of 30 feet, which will leave our next level 22 feet above the river. For the construction of these locks, a great quantity of stone will be required: if, therefore, rock should occur in the deep cutting immediately above, the demand for it here will lessen the expense of quarrying and removing it.	
From 988 to 990 and 16 perches, the distance is 52 perches, commencing and continuing the whole way on a rock; and requiring a wall averaging 10 feet high.	
10 feet walling 52 perches, at $ 45,	2,340 00
From 990 and 16 perches, to 991 and 14 perches, the distance is 26 perches along a hill side. The average depth of cutting will be 4 feet, and the price 16 cents per cubic yard.	
1,695 cubic yards, at 16 cents,	271 00
Carried forward—24 m. 304 perches, cost	$ 119,779 00

Brought forward—24 m. 304 perches, cost	$ 119,779 00
From 991 and 14 perches to 994, the distance is 84½ perches, requiring a wall averaging 22 feet high. 22 feet walling 84½ perches, at $ 103,	8,704 00
One-third of the wall mentioned in the preceding item, must have an extra thickness of 2 feet, on account of its situation being exposed to the ice. An extra allowance may be made of $ 500, for raising the foundation in a few places to the surface of the water. Extra allowance for thickness of the wall,	800 00
Extra allowance for foundation,	500 00
From 994 to 995, the distance is 32 perches, crossing Big Spring Branch, 5½ feet above the tail race of Charles's mill. This is an excellent stream, and ought if possible to be secured by a feeder. There will be necessary, a wall averaging 20 feet high.	
20 feet walling 32 perches, at $ 95,	3,040 00
From 995 to 996, the distance is 28 perches, along a rough hill side. The average depth of cutting will be 5 feet, and the price 25 cents per cubic yard.	
2,424 cubic yards, at 25 cents,	606 00
From 996 to 998 and 18 perches, the distance is 84 perches, on the edge of a bench, stony in some places, and having on it many large trees. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
5,476 cubic yards, at 15 cents,	821 00
From 998 and 18 perches to 1003, the distance is 146 perches, on tolerable ground. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
6,692 cubic yards, at 15 cents,	1,004 00
From 1,003 to 1,004, the distance is 166 perches. For 9 or 10 perches, there will be necessary a wall averaging 22 feet high, where the rock becomes nearly perpendicular with deep water immediately at the base. This rock continues about 27 perches, but	
Carried forward—26 m. 204½ perches, cost	$ 135,254 00

Brought forward—26 m. 204½ perches, cost	$ 135,254 00

with less depth of water. Materials are in great abundance just above, to form a foundation, but the rock projects far into the river, and makes the bed narrow. Ice and trees impinge against it with great force; it will therefore require a wall of great weight and strength, and probably $ 1000 extra, for foundations. The remaining 139 perches along a rough hill side, where the cost will probably be $ 25 per perch in length. The distance in this piece was not measured, but estimated.

22 feet walling 27 perches, at $ 103,	2,781 00
Extra, for foundation,	1,000 00
Excavation 139 perches at $ 25,	3,475 00

From 1,004 to 1,005, the distance is 40 perches. The average depth of cutting will be 4 feet, and the price 20 cents per cubic yard.

2,607 cubic yards at 20 cents,	521 00

From 1,005 to 1,011, the distance is 204 perches. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard. Here we cross Little Conogocheague on an aqueduct 40 feet in length. It is probable some reservoirs may be formed on this stream.

9,350 cubic yards at 12½ cents,	1,169 00
Aqueduct over Little Conogocheague,	2,500 00

From 1,011 to 1,018, the distance is 235 perches. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

10,725 cubic yards at 12½ cents,	1,341 00

From 1,018 to 1,021, the distance is 92 perches, on ground a little sideling. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.

4,217 cubic yards, at 15 cents,	633 00

From 1,021 to 1,036, the distance is 444 perches, on excellent ground. The average depth of cutting will be 3 feet, and the price [illegible] cents per cubic yard.

Carried forward—29 m. 258 perches, cost	$ 148,674 00

Brought forward—29 m. 258 perches, cost	$ 148,674 00
20,350 cubic yards, at 12½ cents,	2,544 00
From 1,036 to 1,038, the distance is 34 perches, along a rough hill-side. The cost of making the canal may be stated $ 20 per perch in length.	
34 perches, at $ 20,	680 00
Near No. 1,038, we descend 8 feet, by one lock, leaving the level along the rocks below, 21.45 feet above the river.	
From 1,038 to 1,051, the distance is 364 perches, along a rocky hill-side, requiring a wall averaging 16 feet high, and, in some places heavier than usual. An allowance of $ 500 may be made for foundations, and $ 500 more for extra strength.	
16 feet walling 364 perches, at $ 75,	27,300 00
Extras,	1,000 00
From 1,051 to 1,053, the distance is 20 perches. The average depth of cutting is 4 feet, and the price 15 cents per cubic yard.	
1,304 cubic yards, at 15 cents,	196 00
From 1,053 to 1,078, the distance is 760 perches, on excellent ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
34,833 cubic yards, at 12½ cents,	4,354 00
No. 1,078, is on the west branch of Great Conogocheague, and terminates this section.	
	$ 184,748 00

SUMMARY

Of the estimates of expense necessary for constructing the second section of the proposed canal, commencing at the western bank of Great Capon in Virginia, and terminating at the western bank of Great Conogocheague in Maryland, 33½ miles.

For excavation, walling, aqueducts, dams, &c. brought forward,	$ 184,748 00
For lockage, 72 feet [illegible] at $ 650 per foot lift,	46,800 00
For 33 culverts, [illegible] at $ 200 each,	6,600 00
Amoun[illegible]	$ 238,148 00

Amount brought forward,	$ 238,148 00
For 20 farm bridges, at $ 300 each,	6.000 00
3 road bridges, at 500 do.	1,500 00
	$ 245,648 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.,	24,565 00
Amount of estimates for the second section, being $ 8.066 per mile, which, rated in proportion to their dimensions on the canals of New York, would be $ 14,626 per mile,	$ 270.213 00

THIRD SECTION

Commences at the same point where the second terminates, at station No. 1,078, (of the leveller's notes, in which we will, in future, omit the 1000, writing this No. 78 only,) on the western bank of Great Conogocheague, at Williamsport in Maryland.

We cross Great Conogocheague, on an aqueduct about 12 perches long. The elevation of our surface line is 25.41 feet above the river at this place.	
The aqueduct over Great Conogocheague, 200 feet long, and 25 feet high,	$ 5,000 00
From 78 to 85, the distance is 188 perches. The first 12 is occupied by the aqueduct just mentioned. The remaining 176 perches, along the foot of the hill, below Williamsport, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
8,067 cubic yards, at 12½ cents,	1,008 00
From 85 to 90, the distance is 162 perches, along a stony hill side. The cost may be estimated $ 15 per perch in length.	
162 perches at $ 15,	2,430 00
From 90 to 92 and 16 perches, the distance is 86 perches, requiring a wall averaging 12 feet high. In every place, for many miles	
Carried forward—1 m. 116 perches, cost	$ 8,438 00

Brought forward—1 m. 116 perches, cost	$8,438 00
back, where walls be necessary, stone of excellent quality may be had on the spot.	
12 feet walling 86 perches at $55,	4,730 00
From 92 and 16 perches, to 105 and 22 perches, the distance is 498 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
22,825 cubic yards at 12½ cents,	2,853 00
From 105 and 22 perches, to 107 and 10 perches, the distance is 48 perches, along a stony hill side. The average depth of cutting will be 4 feet, and the price 25 cents per cubic yard.	
3,129 cubic yards at 25 cents,	782 00
From 107 and 10 perches to 116, the distance is 325 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
14,896 cubic yards at 12½ cents,	1,862 00
From 116 to 118 and 14 perches, the distance is 86 perches, along a steep hill side. The average depth of cutting will be 6 feet, and the price 12½ cents per cubic yard.	
9,460 cubic yards, at 12½ cents,	1,183 00
Near No. 116, we descend 8 feet by one lock.	
From 118 and 14 perches to 151, the distance is 885 perches, on good ground, but a little of the latter part is woodland. The average depth of cutting, will be 3 feet, and the price 13 cents per cubic yard.	
40,563 cubic yards, at 13 cents,	5,273 00
Near No. 151, we descend 8 feet by one lock, leaving our next level 22.50 feet above the river.	
From 151 to 153 and 20 perches, the distance is 90 perches, requiring a wall averaging 10 feet high.	
10 feet walling 90 perches, at $45,	4,050 00
From 153 and 20 perches to 155, the distance is 62 perches, along a stony hill side.	
Carried forward—7 m. 190 perches, cost	$29,171 00

Brought forward—7 m. 190 perches, cost	$ 29,171 00
The average depth of cutting will be 5 feet, and the price 20 cents per cubic yard.	
5,360 cubic yards, at 20 cents,	1,074 00
From 155 to 156 and 4 perches, the distance is 38 perches, requiring a wall averaging 20 feet high.	
20 feet walling, 38 perches, at $ 95,	3,610 00
From 156 and 4 perches to 159, the distance is 98 perches, requiring a wall averaging 12 feet high.	
12 feet walling, 98 perches, at $ 55,	5,390 00
From 159 to 161 and 14 perches, the distance is 96 perches, along a narrow bench. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
6,258 cubic yards, at 15 cents,	939 00
From 161 and 4 perches, to 162 and 10 perches, the distance is 32 perches, along a stony, rough hill side. The cost may be estimated at $ 18 per perch in length.	
32 perches, at $ 18,	576 00
From 162 and 10 perches to 163 and 8 perches, the distance is 22 perches, requiring a wall averaging 23 feet high.	
23 feet walling, 22 perches, at $ 105,	2,310 00
From 163 and 8 perches to 166, the distance is 78 perches, on rough ground. The average depth of cutting will be 6 feet, and the price 16 cents per cubic yard.	
8,580 cubic yards at 16 cents,	1,373 00
From 166 to 186, the distance 641 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
29,379 cubic yards at 12½ cents,	3,672 00
Near No. 186, about a quarter of a mile below Newcomer's, we descend 8 feet by one lock, leaving our next level 22.40 feet above the river.	
From 186 to 191 and 14 perches, the distance is 116 perches, requiring a wall averaging 12 feet high.	
Carried forward—11 m. 31 perches, cost	$ 48,115 00

Brought forward—11 m. 31 perches, cost $ 48,115 00

12 feet walling, 116 perches, at $ 55, 6,380 00

From 191 and 14 perches to 194 and 20 perches, the distance is 106 perches, requiring a wall averaging 22 feet high.

22 feet walling, 106 perches, at $ 103, 10,918 00

From 194 and 20 perches to 196, the distance is 46 perches, requiring a wall averaging 16 feet high.

16 feet walling, 46 perches, at $ 75, 3,450 00

No. 196 is at Galloway's mill, where we may take in a handsome little feeder without any difficulty.

From 196 to 211, the distance is 478 perches, requiring a wall of very different heights, but I think the average will be about 15 feet.

15 feet walling, 478 perches, at $ 70, 33,460 00

From 211 to 213, the distance is 40 perches, along the edge of the bank. The average depth of cutting will be 5 feet, and the price 12½ cents per cubic yard.

3,463 cubic yards at 12½ cents, 433 00

From 213 to 235, the distance is 750 perches, on good ground, belonging to Samuel Lynch. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

34,375 cubic yards at 12½ cents, 4,297 00

From 235 to 237, the distance is 64 perches, along a hill side, stony and in two or or three spots rocky. The average depth of cutting will be 6 feet, and the price 20 cents per cubic yard.

7,040 cubic yards at 20 cents, 1,408 00

From 237 to 240, the distance is 100 perches. The first 12 perches round a point will require a wall 20 feet high. The next 26 perches along a rough hill side, the cost may be stated at $ 24 per perch in length, and the remaining 62 perches will require, in some places, a high wall, in others but little walling, equal, on the average, to a wall 15 feet high.

Carried forward—16 m. 15 perches, cost $ 108,461 00

Brought forward—16 m. 15 perches, cost $108,461 00

20 feet walling, 12 perches, at $95, 1,140 00

Excavation, 26 " 24, 624 00

15 feet walling, 62 " 70, 4,340 00

From 240 to 246, the distance is 128 perches, along a narrow bench at the foot of a rocky hill, on expensive ground. The cost may be stated at $22 per perch in length.

128 perches at $22, 2,816 00

No. 246 ends just above the Seven Springs.

From 246 to 261, the distance is 500 perches, on excellent ground. We have every where choice of depth; 3 feet may be safely assumed, and the price 10 cents per cubic yard.

23,192 cubic yards at 10 cents, 2,319 00

No. 261 ends at Middie Kaaf's saw mill. The saw mill would be useful as a feeder, and ought to be turned into the canal.

From 261 to 268, the distance is 228 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

10,450 cubic yards at 12½ cents, 1,306 00

Near No. 268, we descend 8 feet by one lock, leaving our next level 24.53 feet above the river.

From 268 to 273 and 14 perches, the distance is 150 perches, on tolerable ground. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.

6,875 cubic yards at 15 cents, 1,031 00

From 273 and 14 perches to 276, the distance is 82 perches, along a stony hill side, where the cutting will be expensive in some places. The cost may be stated at $20 per perch in length.

82 perches at $20, 1,640 00

From 276 to 278, the distance is 56 perches. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.

3,650 cubic yards at 15 cents, 548 00

From 278 to 309, the distance is 1,041½ perches, on excellent ground. The average

Carried forward—22 m. 28½ perches, cost $124,225 00

Brought forward—22 m. 28½ perches, cost $124,225 00

depth of cutting will be 3 feet, and the price 10 cents per cubic yard.

47,735 cubic yards at 10 cents, 4,774 00

No. 309 is at Chaplin's saw mill. The stream which drives this saw mill ought to be taken in for a feeder. Just after passing that stream, we descend 9 feet by one lock, leaving our next level 24.06 feet above the river.

From 309 to 311, the distance is 46 perches. The average depth of cutting will be 5 feet, and the price 15 cents per cubic yard.

3,982 cubic yards, at 15 cents, 597 00

From 311 to 312 and 18 perches, the distance is 48 perches along a rocky hill side. The cost may be stated at $18 per perch in length.

48 perches, at $18, 864 00

From 312 and 18 perches to 319 and 10 perches, the distance is 208 perches, requiring a wall averaging 19 feet high.

19 feet walling 208 perches, at $90, 18,720 00

From 319 and 10 perches to 326, the distance is 118½ perches, the average depth of cutting will be 6 feet, and the price 15 cents per cubic yard.

13,035 cubic yards at 15 cents, 1,955 00

From 326 to 338, the distance is 402 perches. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

18,425 cubic yards at 12½ cents, 2,303 00

From 338 to 341 and 16 perches, the distance is 96 perches, along a steep, stony hill side, with some rocks. The average depth of cutting will be 5 feet, and the price 20 cents per cubic yard.

8,311 cubic yards at 20 cents, 1,662 00

From 341 and 16 perches to 342 and 22 perches, the distance is 34 perches, requiring a wall averaging 19 feet high.

19 feet walling, 34 perches, at $90, 3,060 00

From 342 and 22 perches to 344 and 6 perches, the distance is 48 perches, along a rocky

Carried forward—26 m. 7 perches, cost $158,160 00

Brought forward—26 m. 7 perches, cost $158,160 00

hill side. The cost here will probably be $24 per perch in length.

48 perches at $24, 1,152 00

From 344 and 6 perches to 347, the distance is 110 perches, requiring a wall averaging 20 feet high.

'20 feet walling, 110 perches at $95, 10,450 00

From 347 to 368, the distance is 687 perches, passing Shepherdstown, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard,

31,488 cubic yards at 12½ cents, 3,936 00

From 368 to 373 and 12 perches, the distance is 177 perches, along a stony hill side. The average depth of cutting will be 5 feet, and the price 15 cents per cubic yard.

15,324 cubic yards at 15 cents, 2,299 00

From 373 and 12 perches to 382, the distance is 320 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

14,208 cubic yards at 12½ cents, 1,776 00

No. 382 is near the west bank of Antietam creek. It is proposed to cross this creek on an aqueduct, (10 perches long and 30 feet high,) which will probably cost 4,000 00

At the east end of the aqueduct we descend 9 feet by one lock.

It is believed, that by raising the furnace dam 2 or 3 feet higher, the water will be level with our surface after crossing Antietam. This would give over-shot wheels at the mill, whereby at least half the water that is now used would be saved. This saving, if conveyed into the canal, would be an ample feeder, of which the canal at this place will probably be in need.

From 382 to 393, the distance is 358 perches, of which the aqueduct over Antietam occupies the first ten; and for the remaining 348 perches, the ground is good. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

Carried forward—31 m. 59 perches, cost $181,773 00

Brought forward—31 m. 59 perches, cost	$ 181,773 00
15,950 cubic yards at 12½ cents,	1,994 00
From 393 to 399, the distance is 170 perches, along the foot of a stony hill. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
11,081 cubic yards at 15 cents,	1,662 00
From 399 to 407 and 18 perches, the distance is 287 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
13,154 cubic yards at 12½ cents,	1,644 00
From 407 and 18 perches to 410, the distance is 88 perches, along the foot of a stony hill, with one very short piece of walling. The average depth of cutting will be 5 feet, and the price 16 cents per cubic yard. This estimate is deemed sufficient for every expense.	
7,610 cubic yards at 16 cents,	1,219 00
From 410 to 414, the distance is 84 perches, along a rough hill side, with a little walling. The cost will be $ 26 per perch in length.	
84 perches at $ 26,	2,814 00
From 414 to 416, the distance is 47 perches along a hill side, The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
3,064 cubic yards at 15 cents,	460 00
From 416 to 426 and 12 perches, the distance is 234 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
10,725 cubic yards at 12½ cents,	1,341 00
Between Nos. 426 and 427, we descend 8 feet by one lock.	
From 426 and 12 perches to 427 and 14 perches, the distance is 26 perches. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
1,695 cubic yards at 15 cents,	254 00
From 427 and 14 perches to 430 and 2 perches, the distance is 31 perches, requiring a wall averaging 14 feet high.	
Carried forward—34 m. 66 perches, cost	$ 192,531 00

Brought forward—34 m. 66 perches, cost	$ 192,531 00
14 feet walling 31 perches at $ 65,	2,015 00
From 430 and 2 perches to 446 and 10 perches, the distance is 596 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
27,317 cubic yards at 12½ cents,	3,415 00
From 446 and 10 perches to 449 and 10 perches, the distance is 68 perches, requiring a wall averaging 12 feet high.	
12 feet walling 68 perches at $ 55,	3,740 00
From 449 and 10 perches to 456 and 18 perches, the distance is 226 perches on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
10,358 cubic yards at 12½ cents,	1,295 00
Between Nos. 456 and 457, we descend by two locks 14.68 feet to the level of the river at the head of the long canal, in order to procure from the river a supply of water. The first lock ought probably to be 8.68 feet, leaving 6 feet for the last, which will render them less expensive. It appears, that some distance below the bend in the present canal will be found the most eligible site for the lower lock, below which the feeder will be introduced. This object will probably be effected by adding the expense already incurred,	1,000 00
From 456 and 18 perches to 459, the distance is 56 perches, (not noted by the late engineer as to rate of expense.) It is supposed, that without much error, if any, the cost may be stated at $ 15 per perch in length.	
56 perches at $ 15,	840 00
From 459 to 460 and 8 perches, the distance is 34 perches, requiring a wall averaging 8 feet high.	
8 feet walling 34 perches at $ 35,	1,190 00
From 460 and 8 perches to 465, the distance is 132 perches, requiring a wall mostly	
Carried forward—37 m. 218 perches, cost	$ 206,026 00

Brought forward—37 m. 218 perches, cost	$ 206,026 00
on the present one. but in some parts outside where more room is requisite, averaging 10 feet high.	
10 feet walling 132 perches at $ 45,	5,940 00
From 465 to 466, the distance is 18 perches, requiring a wall averaging 15 feet high.	
15 feet walling 18 perches at $ 70,	1,260 00
From 466 to 467 and 8 perches, the distance is 32 perches, along a rough, stony hill side. The cost may be stated at $ 25 per perch in length.	
32 perches at $ 25,	800 00
From 467 and 8 perches to 470, the distance is 34 perches. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.	
2,216 cubic yards at 15 cents,	332 00
From 470 to 471 and 20 perches, the distance is 32 perches. The average depth of cutting will be 3 feet, and the price 20 cents per cubic yard.	
2,770 cubic yards at 20 cents,	554 00
From 471 and 20 perches to 474, the distance is 66 perches, requiring a wall averaging 13 feet high.	
13 feet walling 66 perches, at $ 60,	3,960 00
Near No. 474, we descend 8 feet by one lock. It is possible it may do to place a lock above the last wall, and that the expense would be thereby diminished; but of that I am not certain.	
From 474 to 477 and 8 perches, the distance is 78 perches, along a rough hill side. The cost may be stated at $ 22 per perch in length.	
78 perches, at $ 22,	1,716 00
From 477 & 8 perches to 483, the distance is 105 perches, requiring a wall averaging 10 feet high. For removing rocks, &c. it will be also necessary to make an extra allowance,	3,000 00
10 feet walling 105 perches, at $ 45,	4,725 00
No. 483, is just below the landing at Harper's Ferry, and opposite to the mouth of	
Carried forward—38 m. 363 perches, cost	$ 228,313 00

Brought forward—38 m. 363 perches, cost Shenandoah river, and is the point where this section terminates.	$ 228,313 00
Amount—Distance, 38 m. * 363 perches, cost	$ 228,313 00

SUMMARY

Of the estimates of expense necessary for constructing the third section of the proposed canal, commencing on the western bank of the Great Conogocheague, at Williamsport, and terminating at Harper's ferry, opposite to the mouth of Shenandoah river, 38¾ miles.

For excavation, walling, aqueducts, dams, &c.,	$ 228,313 00
For lockage, 80 feet 8 inches, (in 10 locks,) at $ 650 per foot lift,	52,442 00
For 33 culverts, (noted by the leveller,) at $ 200 each,	6,600 00
For 30 farm bridges, at $ 300 each,	9,000 00
5 road bridges, at 500 do.	2,500 00
	$ 298,855 00
Add for contingencies, engineers, superintendence, &c., 10 per cent.	29,885 00
Amount of estimates for the third section, being $ 8,483 per mile, which, rated in proportion to their dimensions on the canals of New York, would be $ 15,383 per mile,	$ 328,740 00

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* This distance, as laid down in the original, appears to be incorrect; it should be 38 miles, 263 perches.

FOURTH SECTION

Commences at the same point where the third section terminates, at station No. 483, (of the leveller's notes) just below the landing at Harper's ferry, on the Maryland side, where our level is 19.67 feet above the river.

From 483 to 487, the distance is 116 perches, requiring a wall averaging 10 feet high.

10 feet walling 116 perches, at $ 45,	$ 5,220 00
Necessary allowance for extra work,	3,000 00

Near No. 487, we descend 8 feet by one lock.

From 487 to 489, the distance is 62 perches, requiring a wall averaging 10 feet high, with an allowance of $ 1000 for extra work.

10 feet walling, 62 perches, at $ 45,	2,790 00
Allowance for extra work,	1,000 00

From 489 to 493, the distance is 170 perches, on tolerably good ground. The average depth of cutting will be 3 feet, and the price 15 cents, per cubic yard.

7,792 cubic yards, at 15 cents,	1,169 00

From 493 to 495 and 16 perches, the distance is 88 perches, along stony ground. The average depth of cutting will be 3 feet, and the price 25 cents per cubic yard.

4,033 cubic yards, at 25 cents,	1,008 00

From 495 and 16 perches, to 500, the distance is 156 perches, requiring a wall of different heights; and, in one or two places, for very short distances, it may be entirely dispensed with. It may, in the whole, be equal to an average height of 12 feet.

12 feet walling 156 perches, at $ 55,	8,580 00

From 500 to 505, the distance is 181 perches, through C. Weaver's low ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

8,296 cubic yards, at 12½ cents,	1,037 00

From 505 to 511, the distance is 188 perches, on tolerable ground, but stony in some places. The average depth of cutting will be 4 feet, and the price 15 cents per cubic yard.

9,615 cubic yards, at 15 cents,	1,442 00
Carried forward—13 m. 1 perch, cost	$ 25,246 00

Brought forward—3 m. 1 perch, cost	$ 25,246 00
From 511 to 517, the distance is 212 perches, on tolerable ground. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
9,717 cubic yards, at 15 cents,	1,458 00
It appears that a lock of 8 feet will be necessary above Weaver's low ground, and another of 8 feet, near the foot of Payne's falls.	
From 517 to 556, the distance is 1,415 perches, on tolerable ground; but, in some places, a little stony; a small part, also, is through wood land. For the whole, the average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
64,854 cubic yards, at 15 cents,	9,728 00
In the last section, there must be an aqueduct, 2 perches long, over Muddy creek.	
At some convenient place, near 540, there should be a lock of 8 feet lift.	
The aqueduct over Muddy creek,	1,200 00
From 556 to 565, the distance is 290 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
13,291 cubic yards, at 12½ cents,	1,661 00
From 565 to 575, the distance is 336 perches. An aqueduct, 4 perches long, and about 24 feet high, across Catoctin creek, (the banks excellent) will occupy the first part of this distance; and the remaining 332 perches tolerable ground. The average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
The aqueduct over Catoctin creek,	2,500 00
15,217 cubic yards, at 15 cents,	2,283 00
From 575 to 580, the distance is 94 perches, along a very stony hill side, with considerable rocks in some places. The average cost may be stated $28 per perch in length.	
94 perches, at $ 28,	2,632 00
From 580 to 584, the distance is 54 perches, requiring a wall, averaging 20 feet high.	
Carried forward—10 m. 60 perches, cost	$ 46,708 00

Brought forward—10 m. 60 perches, cost	$46,708 00
20 feet walling 54 perches, at $ 95,	5,130 00
From 584 to 595, the distance is 352 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
16,133 cubic yards, at 12½ cents,	2,017 00
Near No. 595, we descend 8 feet by one lock, leaving our next level 20.98 feet above the river.	
From 595 to 599, the distance is 102 perches, along a narrow bench, at the foot of Catoctin mountain, where there will be a few rocks to be removed, and probably a little walling. The expense will perhaps be equal to that of 5 feet depth of cutting, at 25 cents per cubic yard.	
8,831 cubic yards, at 25 cents,	2,208 00
From 599 to 602 and 2 perches, the distance is 47 perches, requiring a wall, averaging 18 feet high.	
18 feet walling 47 perches, at $ 85,	3,995 00
From 602 and 2 perches to 610, the distance is 262 perches, on good ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
12,008 cubic yards at 12½ cents,	1,501 00
From 610 to 617, the distance is 212 perches, along a bench a little below our level, where a line of embankment must be raised from 2 to 7 feet, on the river side; the other side of the canal will be a lime stone bank, and in some places may require puddling; suitable earth is every where convenient. We may state the cost of this embankment as equal to that of an average depth of cutting of 3½ feet, and the price 15 cents per cubic yard.	
11,714 cubic yards at 15 cents,	1,757 00
From 617 to 620, the distance is 48 perches, requiring a wall averaging 18 feet high. 18 feet walling, 48 perches, at $ 85,	4,080 00
From 620 to 640 and 18 perches, the distance is 727 perches. The average depth of	
Carried forward—15 m. 210 perches, cost	$67,396 00

Brought forward—15 m. 210 perches, cost $67,396 00

cutting will be 3 feet, and the price 12½ cents per cubic yard. 18 perches beyond No. 640 is Nolin's ferry.

33,321 cubic yards at 12½ cents, 4,165 00

From 640 and 18 perches to 661, the distance is 750 perches, on good ground, but stony in a few places. The depth of cutting may be stated as averaging 3 feet, and the price 15 cents per cubic yard. No. 661 is on the western bank of Monocasy.

34,375 cubic yards at 15 cents, 5,156 00

From some distance above Nolin's ferry to Monocasy, the line was carried too near the river. The ground for the canal will be along the foot of the hill. The distance will probably be a few perches longer than the measured line.

From 661 to 668, the distance is 223 perches. The first 27 perches will be occupied by an aqueduct 24 feet high, across Monocasy; the next 8 perches by a lock of 8 feet lift; and the remaining 188 perches along a gravelly and stony bank. The average depth of cutting will be 3 feet, and the price 25 cents per cubic yard.

The aqueduct over Monocasy, 27 perches long and 24 feet high, 10,000 00

8,617 cubic yards at 25 cents, 2,154 00

From 668 to 669 and 12 perches, the distance is 42 perches, along better ground, but still somewhat stony and wood land. The average depth of cutting will be 3 feet, and the price 16 cents per cubic yard.

1,925 cubic yards at 16 cents, 308 00

From 669 and 12 perches to 675, the distance is 128 perches, along a stony hill-side. The average depth of cutting will be 5 feet, and the price 20 cents per cubic yard.

11,081 cubic yards at 20 cents, 2,216 00

From 675 to 691, the distance is 558 perches, along the edge of a second bottom, where it is a little stony in some places, though generally very good. The average

rried forward—22 m. 218 perches, cost $91,395 00

Brought forward—22 m. 218 perches, cost	$ 91,395 00
depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
25,575 cubic yards at 15 cents,	3,836 00
No. 691 is the lower end of ——Trunnel's low ground, where we descend 6 feet by one lock.	
From 691 to 697, the distance is 198 perches, along a hill side, steep, stony and rocky. The average depth of cutting will be 5 feet, and the price 25 cents per cubic yard.	
17,142 cubic yards at 25 cents,	4,286 00
From 697 to 699 and 18 perches, the distance is 98 perches, requiring a wall averaging 16 feet high.	
16 feet walling, 98 perches, at $ 75,	7,350 00
From 699 and 18 perches to 704, the distance is 166 perches, along a narrow bottom. This may require a little embankment, and will, perhaps, be equal in cost, to an average cutting of 4 feet depth, at 14 cents per cubic yard. No. 704 is at the marble quarry.	
10,821 cubic yards at 14 cents,	1,515 00
From 704 to 706, the distance is 74 perches, requiring a wall averaging 16 feet high.	
16 feet walling, 74 perches, at $ 75,	5,550 00
From 706 to 707 and 8 perches, the distance is 40 perches, on uneven ground. The average depth of cutting will be 5 feet, and the price 13 cents per cubic yard.	
3,463 cubic yards at 13 cents,	450 00
The late engineer's notes were continued no farther than to the point just mentioned; the levelling and survey were carried to No. 771, when the work was suspended.	
The next following note (except as to distances, which are always taken from the leveller's notes) was formed, and the estimate of probable cost made, according to information received from the late engineer, in his last sickness.	
From 707 and 8 perches, the distance is 2,274 perches on ground generally good, and admitting of choice of depth; but, in some	
Carried forward—30 m. 68 perches, cost	[illegible] 00

Brought forward—30 m. 63 perches, cost $114,382 00

places, being a little waving, and, in some places, a little stony, we may assume an average depth of cutting of 3½ feet, and the price 12½ cents per cubic yard. Station No. 724, ends at Conrad's ferry, 24 miles and 272 perches from the beginning of this section: and station 766, ends at Edwards's ferry, opposite to the mouth of Goose creek, 29 miles and 228 perches from the same point.

125,649 cubic yards, at 12½ cents, 15,706 00

On the 11th day of the 12th month, 1822, the levelling and survey were resumed, and continued to the head of the canal of Little Falls, where they were terminated on the 8th of the same month; Asa Moore, jun. being leveller and surveyor.

From a careful and close examination of the ground, in connexion with the levelling and survey, and notes made on the spot, I have formed the following estimates of cost:

Resuming the work at the end of station No. 771, (where the surface of the ground is 8.93 feet below the surface line of the canal,) we commenced a new series of numbers, the end of our first station being No. 1, &c.; and we assumed, for our base line, the *bottom* (instead of the surface) of the canal, 5.93 feet above ground, at No. 771.

From 771 to 20, the distance is 268.01 chains, on ground very favorable for excavation, generally of alluvial formation, and at the foot of the acclivity on our left. The average depth of cutting will be 3½ feet, and the price 12½ cents per cubic yard.

59,235 cubic yards, at 12½ cents, 7,407 00

From 20 to 28 and 11 chains, the distance is 149.23 chains, on ground generally favorable for excavation, but, in some places waving, and requiring some grubbing. The depth of cutting may be stated as averaging 4 feet, and the price 13 cents per cubic yard.

38,910 cubic yards, at 13 cents, 5,058 00

Carried forward—35 m. 32.99 chains, cost $142,553 00

Brought forward—35 m. 32.99 chains, cost $ 142,553 00

From 28 and 11 chains, to 35 and 6 chains, the distance is 105.34 chains, on wood land, requiring pretty heavy grubbing. The ground is otherwise favorable for excavation. The average depth of cutting may be stated 4 feet, and the price 15 cents per cubic yard.

27,467 cubic yards, at 15 cents, 4,120 00

Near No. 29, we descend 8 feet by one lock.

From 35 and 6 chains, to 36 and 2 chains, the distance is 12.00 chains, passing the stone quarry on expensive ground; the cost may be equal to that of 5 feet depth of cutting at 20 cents per cubic yard.

4,155 cubic yards, at 20 cents, 831 00

From 36 and 2 chains, to 37 and 1 chain, the distance is 8.35 chains, requiring a wall averaging 10 feet high.

10 feet walling 8.35 chains, at $ 180, 1,503 00

From 37 and 1 chain, to 39 and 4.50 chains, the distance is 27.36 chains, along a narrow bench on the margin of the river, and at the foot of a steep stony hill. The average depth of cutting will be 5 feet, and the price 25 cents per cubic yard.

9,475 cubic yards, at 25 cents, 2,369 00

From 39 and 4.50 chains, to 41, the distance is 35,24 chains, along low ground of alluvial formation, very favorable for excavation. The average depth of cutting will be 3½ feet, and the price 12½ cents per cubic yard.

7,789 cubic yards, at 12½ cents, 974 00

No. 41 is on the western bank of Seneka creek, within 1.74 chains of the water's edge. The creek is 2 chains wide, and must be crossed on an aqueduct 3 chains long and 12 feet high. The surface of the creek and river is here 11.66 feet below our base line.

The aqueduct over Seneka, 3,000 00

From 41 to 47, the distance is 98.30 chains along excellent alluvial, low ground at first, but afterwards becoming a little waving and

Carried forward—38 m. 79.58 chains, cost $ 155,350 00

Brought forward—38 m. 79.58 chains, cost	$ 155,350 00
requiring grubbing. The cost will be about equal to that of 3½ feet depth of cutting at 15 cents per cubic yard.	
21,726 cubic yards at 15 cents,	3,259 00
Near No. 47, we descend 16 feet by two locks.	
From 47 to 49 and 2 chains, the distance is 17.82 chains along the foot of a rocky hill. The average depth of cutting will be 4 feet, and the price 20 cents per cubic yard.	
4,646 cubic yards at 20 cents.	929 00
From 49 and 2 chains to 58 and 1.50 chains the distance is 35.77 chains along high cliffs of rocks, passing Seneka Falls, requiring a wall averaging 16 feet high.	
16 feet walling 35.77 chains, at $ 300,	10,731 00
At 58 and 2 chains is the foot of Seneka Falls. The surface of the river here is 12.25 feet below our base line.	
From 58 and 1.50 chains to 62, the distance is 52.13 chains on low ground woodland, requiring pretty heavy grubbing, and a little stony in some places. The average depth of cutting will be 4 feet, and the price 20 cents per cubic yard.	
13,592 cubic yards, at 20 cents,	2,718 00
From 62 to 64, the distance is 28.09 chains on ground cleared, but somewhat stony. The average depth of cutting will be 3½ feet, and the price 17 cents per cubic yard.	
6,208 cubic yards, at 17 cents,	1,055 00
At 63 and 15 chains is Muddy creek, 75 links wide, which must be passed on an aqueduct, with some embankment.	
The aqueduct over Muddy creek,	2,500 00
From 64 to 67, the distance is 33.73 chains on good ground. The average depth of cutting will be 3½ feet, and the price 12½ cents per cubic yard.	
7,455 cubic yards at 12½ cents,	932 00
From 67 to 68 and 1 chain, the distance is 8.06 chains, requiring a wall averaging 12 feet high.	
Carried forward—38 m. 11.16 chains, cost	$ 177,294 00

Brought forward—39 m. 11.16 chains, cost $ 177,294 00

12 feet walling 8.06 chains at $ 220, 1,773 00

From 68 and one chain to 69, the distance is 15.76 chains on tolerable ground at the foot of a hill. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.

5,458 cubic yards at 12½ cents, 682 00

From 69 to 72, the distance is 17.37 chains along a stony hill side woodland. The average depth of cutting will be 5 feet, and the price 25 cents per cubic yard.

6,015 cubic yards at 25 cents, 1,504 00

From 72 to 74, the distance is 14.71 chains along continual cliffs of lofty and almost perpendicular rocks, requiring a wall averaging 23 feet high. To afford room for the canal, the foundation of the wall must be out in the stream. Ice and logs will, in freshets, impinge against it with considerable force; it must therefore be strong. There is stone in abundance at hand, but earth for filling in and lining will be scarce, and must be brought some distance.

23 feet walling 14.71 chains at $ 420, 6,178 00

Extra for foundations, strengthening walls, &c. 2,000 00

From 74 to 75 and 8.36 chains, the distance is 29.88 chains along a rough, stony hill side woodland, equal in cost to an average cutting of 6 feet depth, at 25 cents per cubic yard.

13,147 cubic yards at 25 cents, 3,287 00

From 75 and 8.36 chains, to 77 and 4 chains, the distance is 18.96 chains, along a steep, rocky hill side, requiring a wall, averaging 10 feet high.

10 feet walling 18.96, at $ 180, 3,418 00

From 77 and 4 chains, to 79 and 3 chains, the distance is 27.07 chains, along a rough, rocky hill side, where the expense may be stated as equal to $ 120 per chain in length.

27 07 chains, $ 120, 3,248 00

From 79 and 3 chains, to 85, the distance is 66.29 chains, on ground generally favora-

Carried forward—43 m. 45.22 chains, cost $ 199,564 00

Brought forward—43 m. 45.22 chains, cost	$ 199,564 00
ble for excavation; in some places a little stony, and in some places a little waving. The average depth of cutting will be 3½ feet, and the price 14 cents per cubic yard.	
14,651 cubic yards, at 14 cents,	2,051 00
At 80 and 6.50 chains, is Watt's branch, which must be crossed on an aqueduct, 2 chains long, and 18 feet high.	
The aqueduct over Watt's branch,	3,000 00
From 85 to 92. the distance is 88.61 chains, on expensive ground, mostly on a rough, rocky hill side. The cost may be stated as equal to $ 120 per chain in length.	
88.61 chains, at $ 120,	10,633 00
Near No. 92, we descend 8 feet by one lock.	
From 92 to 103, the distance is 133.66 chains, on ground somewhat waving, and somewhat stony, part wood land. The average depth of cutting will be 3½ feet, and the price 15 cents per cubic yard.	
29,541 cubic yards, at 15 cents,	4,431 00
At the end of No. 103, opposite to the head of the Great Falls, this section terminates.	
Amount—Distance 46 m. 27.49 chains, cost	$ 219,679 00

SUMMARY

Of the estimates of expense necessary for constructing the fourth section of the proposed canal, commencing at Harper's ferry, and terminating at the head of the Great Falls, 64½ miles:

For excavation, walling, aqueducts, dams, &c.	$ 219,679 00
For lockage, 86 feet, (in 11 locks,) at $ 650 per foot lift,	55,900 00
For 73 culverts, (noted by the leveller,) $ 200 each,	14,600 00
For 37 farm bridges $ 300 each,	11,100 00
For 8 road bridges, $ 500 do.	4,000 00
Amount carried forward,	$ 305,279 00

Amount brought forward,	$ 305,279	00
Add for contingencies, engineers, superintendence, &c. 10 per cent.	30,528	00
Amount of estimates for the fourth section, being $ 7,261 per mile, which, rated in proportion to their dimensions on the canals of New York, would be $ 13,167 per mile,	$ 335.807	00

◆

FIFTH SECTION

Commences at the same point where the fourth section terminates, at station No. 103 (of the leveller's notes) opposite to the head of the Great Falls.

From 103 to 109, the distance is 42.00 chains, passing the Great Falls along very lofty and almost perpendicular cliffs of rocks, where we descend 40 feet by 5 locks. We will estimate the cost of these locks at $ 1,000 per foot, because here superior strength will be required to resist the impetuosity of the river during high freshets. For the same reason, in a less degree, all the remainder of the lockage to tide water will be estimated at $ 750 per foot.

The cost of this piece of canal may be estimated as follows:

The first 12 chains at $ 200, (the locks occupying 9;) the remaining 21 chains at $ 500 per chain in length.

12 chains at $ 200,	$ 2,400	00
21 " " 500,	10,500	00
From 109 to 124 and 3 chains, the distance is 89.13 chains, along a rocky ravine on the south side of Bear Island, in which ravine we descend 28 feet by four locks. The cost may be stated $ 60 per chain in length, and $ 2,000 extra, for a strong dam across a ravine, from this to the river.		
89.13 chains, at $ 60,	5,348	00
Extra, for a dam,	2,000	00
From 124 and 3 chains to 125, the distance is 20.00 chains, requiring two strong dams. The cost for the whole piece, may be estimated at $ 400 per chain in length.		
20 chains, at $ 400,	8,000	00
Carried forward—1 m. 71.13 chains, cost	$ 28,248	00

Brought forward—1 m. 71.13 chains, cost	$ 28,248 00
From 125 to 132, the distance is 45.77 chains, requiring a wall averaging 22 feet high.	
22 feet walling 45.77 chains, at $ 412,	18,857 00
From 132 to 135, the distance is 14.22 chains on favorable ground. The average depth of cutting will be 3 feet, and the price 12½ cents per cubic yard.	
2,607 cubic yards, at 12½ cents,	326 00
From 135 to 137 and 2 chains, the distance is 15.00 chains, requiring a wall averaging 20 feet high.	
20 feet walling 15 chains, at $ 380,	5,700 00
From 137 and 2 chains to 140, the distance is 39.47 chains, on very expensive ground, requiring a wall most of the way, of very different heights. The cost of making this piece of canal, may average $ 200 per chain in length.	
39.47 chains, at $ 200,	7,894 00
From 140 to 144, the distance is 10.77 chains through a ravine, where the cost may be stated as averaging $ 20 per chain in length.	
10,77 chains, at $ 20,	215 00
From 144 to 146 and 12 chains, the distance is 32.42 chains, and on very expensive ground, along high perpendicular rocks, with deep water at their base. The cost may be estimated at $ 500 per chain in length.	
32.42 chains, at $ 500,	16,210 00
From 146 and 12 chains to 149, the distance is 35.56 chains. The average depth of cutting will be 5 feet, and the price 15 cents per cubic yard.	
12,314 cubic yards, at 15 cents,	1,847 00
From 149 to 158 and 13 chains, the distance is 83.37 chains, along a steep and rocky bank. The cost will probably be $ 120 per chain in length.	
83.37 chains, at $ 120,	10,004 00
In the last mile we descend 14 feet by two locks. It is probable, that by locating these	
Carried forward—5 m. 27.71 chains, cost	$ 89,301 00

Brought forward—5 m. 27.71 chains, cost	$ 89,301 00

locks judiciously, the expense of this piece of canal may be diminished.

From 158 and 13 chains to 173, the distance is 282.93 chains, generally along a narrow bench of low ground at the foot of a bank. A considerable part of this piece is favorable for excavation; some parts of the bank are rocky, and several parts will require walls. The whole piece may be estimated as follows:

10 feet walling, 33 chains at $ 180,	5,940 00
And for the remaining 249.93 chains, the average depth of cutting will be 3 feet, and the price 15 cents per cubic yard.	
55,239 cubic yards, at 15 cents,	8,286 00
No. 173, is at the head of the canal of Little Falls, where our estimates are concluded, and where our surface level is 20.28 feet above the surface of the present canal.	
Amount—Distance 8 miles, 70.64 chains, cost	$ 103.527 00

SUMMARY

Of the estimates of expense necessary for constructing the fifth section of the proposed canal, from its commencement at the head of the Great Falls, to the head of the canal of Little Falls, 9 miles:

For excavation, walling, aqueducts, dams, &c.		$ 103,527 00
For lockage 40 feet (in 5 locks) at $ 1000,	$ 40,000 00	
For lockage 62 feet (in 9 locks) at $ 750,	46,500 00	
For lockage 102 feet (in 14 locks)		86,500 00
For 12 culverts (noted by the leveller) at $ 200 each,		2,400 00
For 5 farm bridges, $ 300 each,		1,500 00
		$ 193,927 00
Add for contingencies, engineers, superintendence, &c. 10 per cent.		19,393 00
		$ 213,320 00

Amount of estimates for the fifth section, being $ 23,702 per mile, which, rated in proportion to their dimensions on the canals of New-York, would be $ 42,980 per mile, $ 213.320 00

* * *

RECAPITULATION AND GENERAL SUMMARY.

For 182 miles of canal, comprising besides excavation, walling, aqueducts, and dams, 487 feet of lockage, 205 culverts, 122 farm bridges, and 20 road bridges.

For	1st	section,	54½	miles,	$ 7,835	per mile,	$ 426.994	00
	2d	do.	33½	do.	8,666	do.	270.213	00
	3d	do.	38¾	do.	8,483	do.	328.740	00
	4th	do.	46¼	do.	7,261	do.	335,807	00
	5th	do.	9	do.	23,702	do.	213,320	00
Total amount,			182	miles,	$ 8,544,	av. m.	$ 1,575,074	00

This average rate on the whole canal, ($ 8,544 per mile,) would, if applied in exact proportion to a canal of the same dimensions as those in the State of New York, be $ 15.493 per mile; and this accords with the actual cost of such parts of the New York canals as resemble ours in proportion of lockage, of walling, of rocky ground, and laborious excavation.

I delivered to the joint commissioners of Virginia and Maryland, a summary only of the estimates contained in this report, exhibiting the final amount $ 1,578,954. On a careful re-examination of every item, I find I had made an omission of $ 6,732 in the first section, and of $ 388 in the second, making the amount in these two sections too little by $ 7,120, and that in summing up I had made the amount of the 4th section too much by $ 11,000. If these corrections be applied to the amount in the summary furnished to the commissioners, it will then be $ 1,575,074, as in this report.

It will, no doubt, be deemed expedient and proper to furnish several connections between the river and canal, for the accommodation of those on the side of the river opposite to the canal, and it is possible some feeders from the river, more than are noted, will be necessary. If, on these accounts, we add

$ 24,926 to our last amount, we shall have $ 1,600,000; and if, pursuant to the example of your board in estimating the James river plan, we add to this last sum 25 per cent., the amount will then be $ 2,000,000, a sum which will be quite as small as is generally expected, and affording $ 400,000 for a compromise with the Potowmac company, sufficient, it is believed, to induce it to surrender its charter without a judiciary struggle, which, (to say the least of it,) would probably for several years prevent every step toward the accomplishment of a plan to which thousands, besides Virginians and Marylanders, are looking with ardent hope, and sufficient to remove every obstacle to a subscription of the whole stock of that company to such new fund as may be authorised by law.

From an inspection of the notes on the Potowmac, left by the late engineer, it is obvious that it was his intention to make a report *in full detail*. I have endeavoured to fulfil that intention. Although these details, not admitting of decorations of language, may seem tedious and uninteresting, they are nevertheless very useful. They show to the Legislature the data on which the estimates are made, and the principles on which is founded the plan soliciting their patronage; and they will also contribute important aid to the engineer who may *locate*, and to the agent who, on behalf of the public, forms contracts for making the proposed canal.

It is expected that the field notes of the leveller and surveyor, and a map and profile of the river and canal, will be presented hereafter; they are not now ready. I herewith present the notes of the engineer.

All of which are respectfully submitted by

ISAAC BRIGGS.

Richmond, 1st mo. 23d, 1823.

REPORT

ON THE

ROANOKE, DAN, AND STAUNTON RIVERS,

BY ISAAC BRIGGS.

To the President and Directors of the Board of Public Works of the Commonwealth of Virginia.

GENTLEMEN,

On the Roanoke, the Dan and Staunton rivers, their circumstances, and susceptibility of improvement, I respecfully present the following report, from the notes of the late engineer.

Asa Moore, junior, was employed as leveller, and Joseph E. Bentley as surveyor. In company with those assistants, the late principal engineer commenced his journey on 4th month 29th, 1822; and on 5th month 8th, arrived at Rocklanding, on Roanoke. The next eight days were spent in making the necessary preparations; and on the 5th month 17th, were commenced the survey, levelling and examination of the Roanoke river, beginning at the entrance of the canal at Rocklanding, opposite Harvey's island.

The 1st mile, begins with two or three small ripples, on which there is not sufficient depth at low water. The navigation here, will probably be sufficiently improved by a small dam, that is yet to be erected for the purpose of giving depth in the canal in dry seasons. At about 100 perches there is a small fall which has been improved in one place and requires no more—then, good navigation to the end of the mile. The mark is on a small sycamore just above a gut on the south side of the river, on which side our survey is carried. The whole fall in this mile is 2.85 feet.

The 2nd mile affords throughout excellent navigation. On a part of the first mile, the width to the island was about 250 yards: in this it has narrowed to less than 200. The mark is on a sycamore, about 30 perches above Harvey's ferry to he island. The whole fall is 0.26 feet.

The 3rd mile affords good navigation, but rather brisker water than the last. The mark is on a small maple. The difficulty in getting down the bank prevented the ascertainment of the fall to the end of the mile. The width to the island is about 200 yards.

The 4th mile, near the beginning, we cross the mouth of Great Creek. The navigation, although the current is a little swift, is good. The width of this arm of the river gradually diminishes to 150 yards at the head of the island. The present boat passage is a narrow one, between this and another island just below the falls. The mark is on a small black oak at the corner of the field 100 yards below the falls. In the last 2 miles, the whole fall is 3.01 feet.

The 5th mile commences with Eaton's falls. The passage already mentioned between the islands, is close to the small upper island and is liable to be filled and to change; the remainder of the opening is very shallow with a rock bottom. It appears, however, that there is a ledge extending from the northern shore to the large island (Harvey's) a short distance from its head. A small obstruction of brush and stone one foot higher than where the surface of the water is at present (which is at least one foot lower than the winter standard) would at all times give a safe and sufficiently deep passage between the islands, and also be very useful in low water in keeping a full supply at the canal. The passage through the principal fall has been sluiced in some places judiciously, but does not afford sufficient depth throughout, when the river is low: it is now very hard to ascend, even with very light loads, and, if water sufficient was turned into the passage to make it deep enough at all times, it would be still harder. In fact, another track must be found for ascending boats, with any thing like full loads, and this will probably be near the northern shore, which gives by far the greatest distance, and, of course, least rapidity. But, whenever the circumstances of the company will permit, this fall ought, without hesitation, to be improved by a lock, at the southern shore, of about 9 feet lift, just below the lowest break of the falls. A line of walling, or some work to confine the water, must be run nearly in a straight direction from the lock up the river, 300 to 400 yards. It will be 9 to 2 feet; the average may be 6½ feet high. The lock may be formed by heavy dry walls, with upright timbers built in, and planked. The whole fall is 11.01 feet, of which one foot may be above the lock, and one foot in the brisk water below. The cost of this improvement might be

For the dam,	$ 3,500 00
And for the lock,	4,000 00

Brought forward—Fall, 17.13 feet, cost $7,500 00

Query. Ought money to be spent for a sluice? The mark is on a sycamore, a short distance below Eaton's ferry.

The 6th mile, is mostly opposite to Hyde's island; the whole of it affording excellent navigation. The mark is on an elm.

The 7th mile is also opposite to Hyde's island, and affords good navigation to near the upper end, where Hamlin's shoals commence. The mark is on a maple. In the last two miles, the whole fall is 3.99 feet.

The 8th mile, commences near the upper end of Hyde's island, and continues the whole way in Hamlin's shoals The river is very wide, and small islands are numerous. The present boat track is crooked toward the end; and shallow, where the river is low. The mark is on a small locust tree.

The 9th mile, is also in Hamlin's shoals, and commences in the same kind of water as in the last mile; but the fall soon becomes greater, and the passes through the ledges extremely crooked, narrow, and difficult. The river is at least half a mile wide. The mark is on a sweet gum, close to the water, just above a high rock. In the last 2 miles, the whole fall is 16.11 feet. The same kind of crooked sluices, and difficult navigation, continue for about a ¼ in—

The 10th mile—to the head of Hamlin's shoals, at the Sturgeon hole. To improve Hamlin's shoals, it is absolutely necessary that some time should be spent in a very careful examination of the best connected track that can be obtained; which must then be cleared of detached rocks, and the most prominent points and protuberances of the fixed rocks broken off; perhaps, in a few instances, blasted by powder. Then commencing at the upper end, at the first place that is too shallow, let the depth be increased by wings, where they will be least expensive, always turning the points downward, toward the

Carried forward—Fall, 17.13 feet, cost $7,500 00

Brought forward—Fall, 17.13 feet, cost $ 7,500 00

entrance of the sluice; the sides of which should be carried so far down as to make the surface of the water regular and easy to ascend; and so continue from ledge to ledge. If the work be well laid out and executed, very little exertion will be necessary to keep the boat in the sluices. There should be no guide locks, wing walls, or sluice walls higher than the surface of the water when there is just a sufficient depth in the sluice. Boatmen will need no other guide than the draft of the water, until it becomes high enough to pass with safety, over the top of these low walls. But, if there were places near the sluice, higher than necessary, boats are liable to run on them, and be wrecked. At the Sturgeon hole, near the beginning of this mile, is the commencement of Balliard's shoals, which require the same kind of improvement as the last, but in a less degree. The cost of improving Hamlin's shoals will probably be $ 1,500 per mile. From the Sturgeon hole, the river narrows to about 500 yards at the end of the mile. The mark is on a large pine at a point. The whole fall is 5.98 feet.

2½ miles Hamlin's shoals, at $ 1,500, 3,750 00

The 11th mile, commences with water shallow and swift, but mostly good. From Sturgeon hole to the end of Balliard's shoals, the cost of improvement will probably be 1,000 00

The mark is on a birch near Pretty Creek. The whole fall is 6.84 feet.

For improving Pugh's Falls, (5.61 feet,) situated in this mile, there are two plans. The most eligible is, by means of a lock of 5½ feet lift, for which the ground is favourable on the south shore. The wing would be short and low. I suppose the whole ought to be done for $ 3,500 00

The other plan is by a graduated sluice, adjoining the south shore, commencing a little below the mouth of Pretty Cr[illegible] extending such a distance below th[illegible]

Carried forward—Fall, 50.05 fe[illegible] [illegible] 00

Brought forward—Fall, 50.05 feet, cost $8,250 00

breach of the falls, as to give for the whole descent, a base of about 800 feet, or more if it can conveniently be obtained. The sluice must be graduated, and perhaps cut down a little at the head. A short wing will turn in the water; a heavy rough wall, raised 4 feet above the surface, and having the curve of the shore so near the lower end, where the water in the sluice will begin to be higher than that in the river, will answer the purpose. From that point downward, a ridge of brush and stone should be thrown up, giving width enough for two boats to pass each other, to prevent the water in the sluice from spreading. The large wall will be a tracking way for the boatmen, where their power will be much greater than it would be with poles. I think such a sluice might be made for $1,500.

The 12th mile commences a little way below Cotton Island, between which and the southern shore, the arm of the river is about 60 yards wide. Near the head of the island, there is a small ledge to be cut through, and then the water is good to Lizard-Creek falls. At the first ledge, there must be a wall and towing way, 150 to 200 feet long, close in on the southern shore. At the second ledge, there is more difficulty—contrary to general rule, the sluice must be made on the convex shore; but as, for a long distance above, the river has a very gentle current, and that in the sluice will be much more rapid, there will be little danger of its filling. This sluice may be close to the southern shore with a tracking way, or there may be in the stream, with two walls, a graduated sluice of not more than 6 inches fall, for 100 feet base. The mark is on a small white oak, at the head of Lizard Creek falls. Fall 4.65 feet. Cost of the improvements mentioned above 1,100 00

The 13th mile, affords mostly tolerable water, but in some places shallow in dry sea-

Carried forward—Fall, 54.70 feet, cost $9,350 00

Brought forward—Fall, 54.70 feet, cost $9,350 00

sons. The navigation must be improved by cutting and swelling, so as to obain 8 or 9 inches more depth of water over these shoals, called Stone House Creek Shoals. Stone House Creek comes in opposite, and divides the counties of Halifax and Warren. The river is here 500 or 600 yards wide. The mile mark is on a birch fall, 2.19 feet. Cost of the improvements proposed in this mile, 800 00

The 14th mile, contains the Collar-Bone Shoal, where there is not more than 10 inches depth in low water. It will be necessary to raise the ledge 5 to 8 inches, for a distance of 60 to 80 feet; the river is too wide for swelling. The mark is on a small sycamore on the bank. The fall is 2.14 feet.

Cost of the improvement, 400 00

The 15th mile, affords very good navigation, except a small gravel shoal near the end, called Lower's Gravel. This shoal may be very easily improved, by a sluice near the southern shore. The mark is on a willow oak, on the bank.

Cost of improvement, 100 00

The 16th mile affords excellent navigation. The mark is on a large Spanish oak; the fall taken on the 5th month 24th, appears to be 3.07 feet, but the sudden rise in the water makes it appear a great deal more than it would in its usual state.

The river was rising yesterday, and a great rain last night, made it too high to proceed to-day, 5th month 23rd. We resumed our progress 5th month 24th.

The 17th mile, navigation the same as the last mile. The mark is on a sycamore.

The 18th mile, navigation the same. The mark is on a sweet gum on the bank.

The 19th mile, navigation the same. Nothing to mark on. The whole fall, in the last 3 miles, is 1.01 foot.

The 20th mile, navigation the same. The mark is on a small sycamore.

Carried forward—Fall, 62.10 feet, cost $18,150 00

Brought forward—Fall, 62.10 feet, cost $18,150 00

The 21st mile, navigation the same. The mark is on a maple.

The 22nd mile, navigation the same. The mark is on a sycamore.

The 23d mile, navigation the same. At about 256 perches in this mile, we cross the boundary line from North Carolina into Virginia. The mark is on a large sycamore.

The 24th mile, contains Black's shoals, where there is not sufficient depth in low water. The river is now too high to see the ledges; but, from information, I am led to believe that a few narrow ledges must be cut down, and the water swelled by a few low wings. I suppose it might all be done for 600 00 The mark is on a poplar.

The 25th mile, affords good navigation. The mark is on a birch. The whole fall in the last 6 miles is 7.96 feet.

The 26th mile—For many miles past, the river is clear of islands, and its average width 300 to 400 yards. In this mile is the Horse-pond island; at the lower point of which, commences the Horse-pond shoals. The mark is on a hickory, nearly half way of the island.

The 27th mile, includes the remainder, and worst part of Horse-pond shoals. The fall is not rapid, but long, consisting of a number of small ledges. The river is now too high to examine them satisfactorily. The present boat passage is near the northern shore, and very crooked, in order to take the deepest passes through the ledges. A part of the course is below a point; sluices made in this direction will be liable to be filled with course gravel. A trace, in the manner before described, must be sought some distance further from the same shore, and improved in the manner described for Hamlin's shoals; or a wing of brush and stone may be run from the upper point of the island, obliquely to the northern shore, about

Carried forward—Fall, 70.06 feet, cost $18,750 00

Brought forward—Fall, 70.06 feet, cost **$18,750 00**

the head of the old mill-race, so as to turn the whole of the river when very low, through the narrow arm between the islands and the southern shore. This would give sufficient depth at all times. The wing would be probably not more, at any place, than 2, nor average more than 1 foot high; the length, perhaps, would be 400 yards. Above, there will probably be necessary one or two short wings to improve some shallow places. If the last mentioned plan will answer, the expense need not be more than $250; but a sluice through the ledges would cost much more. The safest estimate of the cost perhaps will be 600 00

The mark is on a large sycamore. The whole fall in the last two miles is 8.95 feet, of which the shoals occupy about 5 feet; but different stages of the water may give different results.

The 28th mile, affords mostly good navigation; but, near the upper end, the water is shallow. The depth must be improved by slight wings, &c. Cost, 100 00

The mark is on a sweet gum.

The 29th mile—The navigation is good. The mark is on a beech, just above the mouth of Smith's creek.

The 30th mile, navigation the same, nothing to mark on.

The 31st mile, navigation the same, at 224 perches in this mile is St. Tammany's ferry. The town of St. Tammany is on the north side of the river, which is here rather less than 300 yards wide. The mark is on an oak. The whole fall from the 27th mile to the ferry is 1.54 feet.

The 32nd mile, navigation the same. The mark is on an elm.

The 33rd mile, navigation the same. The mark is on a walnut, on the bank.

The 34th mile, navigation the same. The mark is on a small sycamore.

Carried forward—Fall, 81.56 feet, cost **$19,450 00**

Brought forward—Fall, 81.56 feet, cost $ 19,450 00

The 35th mile, navigation the same. At 76 perches in this mile is Hicks's ferry (formerly Good's) where we crossed over to the north side with our levelling and survey. The mark is on a sycamore, on the north side of the river. From Hicks's ferry to St. Tammany's the whole fall is 1.30 feet.

The 36th mile, navigation the same. The mark is on a large elm, 58 perches below Roberts's ferry.

The 37th mile—The navigation requires no improvement. At 58 perches in this mile is Roberts's ferry, from which to Hicks's ferry, the whole fall is 2.32 feet. The mark is on a sycamore.

The 38th mile, contains Bilbo's shoals. Some improvement in the navigation is necessary. A little walling of loose stone will answer at the lower end, but at the ledge above, a sluice will be required. Some cutting down and some swelling will effect it, by continuing the sluice walls a sufficient distance to render the slope easy. The cost of this improvement may be 200 00

The mark is on an elm. From the end of this mile to Roberts's ferry, the whole fall is 5.46 feet.

The 39th mile, begins with swift water, about the lower end of Briggs's island.—Briggs's island shoals commence a few hundred yards above. The fall is not great, but the water is considerably swift and shallow from shore to shore. The present boat passage is in a direction tolerably correct, and must be improved by swelling, as the water is every where shallow for a considerable distance. Nothing to mark on.

The 40th mile, continues with the shoals. We have here very much the same kind of water, and the same kind of improvement will be necessary as that proposed for the last mile. These shoals will require great length of wings to swell the water, or great length of

Carried forward—Fall, 90.64 feet, cost $ 19,650 00

Brought forward—Fall, 90.64 feet, cost $ 19,650 00

sluices confined on both sides, or a part of both, as may be found most expedient. In the last two miles, the whole fall is 7.68 feet. Nothing to mark on. For the improvements proposed in the last 2 miles, the cost will probably be 900 00

The 41st mile contains a small shoal, called the Featrock shoal. To improve it, may cost 100 00 Nothing to mark on.

The 42nd mile affords a good navigation, with the exception of a very small shoal at the beginning. The mark is on a sycamore. In the last 2 miles, the fall is 2.95 feet.

The 43d mile, the navigation is pretty good. The mark is on a beach, just above Haskins's ferry, where we cross, with our levelling and survey to the south side of the river. From the ferry to the beginning of the mile, is 2.11 feet.

The 44th mile, the navigation is good. The mark is on a birch.

The 45th mile, navigation the same. The mark is on a sycamore.

The 46th mile, navigation the same. The mark is on a large Spanish oak.

The 47th mile, navigation the same. The mark is on a sycamore.

The 48th mile, commences with Butcher's creek falls, where the river is not much more than 200 yards wide, but increases in width continually, to the lower end of Terry's island, near the termination of this mile. The water is swift, but no want of depth. At 146 perches, is Taylor's ferry, where we cross with our levelling and survey to the north side of the river. From Taylor's to Haskins's ferry, the fall is 5.62 feet. The mark is on a sycamore.

The 49th mile, commences near the foot of Terry's island falls. Nothing to mark on.

The 50th mile, continues along those falls and terminates near their head. The mark is on an elm, a quarter of a mile below a fish-

Carried forward—Fall, 109.90 feet, cost $ 20,650 00

Brought forward—Fall, 109.90 feet, cost **$ 20,650 00**

trap at the head of the falls. In the two last miles are situated the worst of the falls. The present passage is between some small islands at the head of the falls near the northern shore, then turning suddenly to the right, crosses over above the head of a small island near the southern shore, and passes down through openings in the ledges, (most of which are too shallow in low water.) to near the Eagle-point, then running close in with the point, takes the deep water between the head of Terry's island and the southern shore; or instead of running close to the point, passes through Johnson's sluice, and by a crooked and dangerous passage, reaches the same place. Thence down to the lower point of the island, the navigation is said to be always tolerable, though swift. The river having risen last night, prevented my having so complete and satisfactory a view of these falls, as I could have wished. I could see enough however to convince me, that it is one of the most difficult rapids to improve, that we have yet seen. Two plans present for the improvements; one is to use the present boat track, improved from the head of the shoals to the Eagle-point, where a towing way must be made in as straight a direction, as the ground will admit, that is, by bringing it quite on the rock in the middle, and making it depart a short distance from the shore at each end, still, however, it will curve outward. This shape ought never to be chosen. Imperious necessity alone, will justify its adoption. When water is directed obliquely toward a concave wall, it always adheres to it quite to the lower extremity; but, under the same circumstances in other respects, it always inclines to leave a convex wall, so that an outer low wall concentric with it, or several wings to confine and direct the current, necessary; and even then, there will danger of stones stopping close to

ied forward—Fall, 109.90 feet, cost **$ 20,650 00**

Brought forward—Fall, 109.90 feet, cost $20,650 00

the convex wall. To make this tolerably easy to ascend, the wall must be at least 250 feet long, and the bed well graduated. The water is deep both above and below the ledge, so that the wall (which must be at least four feet thick, and three or four feet above the surface of low water, well secured at the top with large stones,) will be expensive. The cost of the whole on this plan will be very uncertain, but I suppose it would be about 1,000 00

The other plan is, to commence at the small islands before mentioned at the head of the falls, and to lay out a course nearer the northern shore, all the way down the foot of Terry's island, not less than 2½ miles long, in which distance there are many sheets of good water for short spaces, but a great number of ledges would require some deepening, and in the whole, a great length of wing and sluice walls; yet when done, of these two plans, this would give much the most perfect navigation. The cost would probably be 2,500 00

The 51st mile, at about 80 perches, is the head of the falls. From the smooth water above them to Taylor's ferry, the fall is 16.47 feet. Then good navigation to the end of the mile. The mark is on a willow.

The 52d mile, affords tolerable navigation. Nothing to mark on.

The 53d mile—navigation the same. Within 24 perches of the end of this mile is Field's ferry; from which, to the smooth water at the head of Terry's island falls, the fall is 5.59 feet. The mark is on a sycamore.

The 54th mile, contains a small shoal at the head of a little island, where the water is rather shallow in dry seasons. It will be necessary to extend the wing of the fish-trap obliquely up the river, to turn in more water, which may then be contracted as required. The mark is on a sycamore.

Carried forward—Fall, 131.96 feet, cost [illegible] 00

DAN RIVER.

The miles are so numbered as to give the distance from Rocklanding.

The 61st mile commences at its confluence with Staunton; we proceed up the south side of Dan river 198 perches, and then cross over to the north side. The water is shallow, and, when low, will require a little swelling, which may cost $ 200 00
Nothing to mark on.

The 62d mile, affords good navigation. The mark is on a sycamore.

The 63d mile, navigation the same. The mark is on a beach. The fall is 3.49 feet.

The 64th mile, navigation the same. The mark is on a sycamore.

The 65th mile, affords good navigation. The mark is on a sycamore.

The 66th mile, near its end, enters Nelson's shoals, which require a wing or two near the head, and a sluice. These may cost 150 00
The mark is on an elm.

The 67th mile, contains some small shoals, to improve which, may cost 75 00
The mark is on a sycamore.

The 68th mile, includes the Marble-yard shoals, more than a quarter of a mile in extent, where the river is very wide and shallow, and the current brisk. All that can be done here is by means of wings, to contract the water in width, and swell it in height, and sluices to graduate the descent. The cost, at this place, may be 200 00

From the end of this mile to the end of the 63d mile, the fall is 8.63 feet. Nothing to mark on.

The 69th mile—we soon meet with swift and shallow water, which continues for about

Carried forward—Fall, 12.12 feet, cost $ 625 00

Brought forward—Fall, 12.12 feet, cost	$625 00
200 yards, and after a short distance of good water, another shoal occurs, somewhat longer. These must be improved by two or three wings and some sluices. The fall is but small, the cost will therefore be inconsiderable, say, for the mile,	200 00
The mark is on a sycamore.	
The 70th mile—near the beginning is an old fish dam, where a little improvement is necessary. At 258 perches is Aaron's creek, and just above, are Bagby's shoals, 400 yards long. The mark is on a birch. Cost, for the mile,	250 00
The 71st mile—the water is rather shallow, but the fall is moderate. It will probably be necessary to swell the water in two or three places by wings. Probable cost,	200 00
Mark on an ash.	
The 72d mile—still the same kind of water for 208 perches to the mouth of Peters's creek, at the lower end of Hycotee falls. From the mouth of Peters's creek to the end of the 68th mile, the fall is 10.63 feet. The present course over the first of the Hycotee falls, below the island, is crooked and somewhat dangerous. It may be improved by opening a sluice through the ledge close to the southern shore, at a point of rocks. A wall may be built in contact with the shore, to be used as a towing way for ascending boats in low water. In high water the ascent will be easiest along the northern shore. The wall must extend from deep water above, to deep water below the ledge. The mark is on a sycamore.	
The 73d mile, Hycotee creek enters on the south side, a little way above the lower point of Hycotee island: a short distance above this, commences a very rapid gravel shoal, which continues to near the head of the island where it is terminated by several rocky ledges and considerable fall. The ascent is hard, and the descent crooked and somewhat	
Carried forward—Fall, 22.75 feet, cost	$1,275 00

Brought forward—Fall, 22.75 feet, cost $ 1,275 00

hazardous near the head, with a deficiency of depth in dry seasons, in most places. In descending, the pass is made crooked and dangerous by a few rocks just above the entrance through the principal ledge. These rocks ought to be removed. The track is tolerably direct to very near the head of Hycotee island; then, turning short to the right, it requires great exertion to reach a sluice near the southern shore. Here the navigation may, and ought to be improved, by opening a sluice through the ledge: at the head of the island just mentioned, about mid-way of the stream. The openings through all the ledges will then lie in a direction very easy to pass. Below these ledges, all the improvement that can be made, is to collect the water in sluices, and swell it in height, by wings as before described. Of these there will be many; but as this arm is narrow, they will be short. The fall being great, the ascent will, of course, be always laborious. In low water, boats must ascend by the same track in which they pass down; but in high water, they will ascend with less difficulty between the island and the northern shore. There are several small islands above the principal one. The whole length of these falls is one and ¾ miles, and just above the head of them, this mile ends. The mark is on a sycamore; whence to the mouth of Peters's creek, the whole fall is 12 89 feet.

I estimate the cost of improving the navition for the last 2 miles, in the manner stated, 1,100 00

The 74th mile affords excellent navigation. The mark is on a birch.

The 75th mile:—in the first part of this mile, the navigation is still good, but in the latter part, the river becomes wide and shallow. Nothing to mark on.

The 76th mile:—the river continues rather shallow to the end of this mile, which is a short distance above the mouth of Ban-

Carried forward—Fall, 35.64 feet, cost $ 3,375 00

Brought forward—Fall, 35.64 feet, cost $3,375 00

nister river. The mark is on a beach. It is very uncertain what may be the cost of the necessary improvements in the two last miles; probably 300 00

The 77th mile affords excellent navigation. The mark is on a sycamore.

The 78th mile, navigation the same. The mark is on a sycamore.

The 79th mile, navigation the same. At 118 perches is Torian's ferry, where we cross over with our levelling and survey, to the south side of the river, and whence to the end of the 73d mile, the whole fall is 5.61 feet. At the end of the mile, nothing to mark on.

The 80th mile—In this mile is Boyd's fish dam, which at present is hard to ascend, and about 100 yards of shallow water. It can easily be improved by a graduated sluice from the ledge, and two short low wings to turn in the water. The cost may be 100 00

Then good navigation to the end. The mark is on a sycamore.

The 81st mile affords good navigation. Nothing to mark on.

The 82d mile, navigation the same. Nothing to mark on.

The 83d mile—In this mile are Boston's shoals. The water is brisk and shallow, for about a quarter of a mile, but there is not much fall.. It will require a few short wings, and perhaps a short sluice at the lower end. The cost may be 150 00

The river is here, about 100 yards wide. The mark is on a sycamore.

The 84th mile affords good navigation. The mark is on a sycamore.

The 85th mile—In this mile, there is a small ledge where very little improvement may be necessary. Nothing to mark on.

The 86th mile affords good navigation. The mark is on a sycamore.

Carried forward—Fall, 41.25 feet, cost $3,925 00

Brought forward—Fall, 22.75 feet, cost $ 1,275 00

hazardous near the head, with a deficiency of depth in dry seasons, in most places. In descending, the pass is made crooked and dangerous by a few rocks just above the entrance through the principal ledge. These rocks ought to be removed. The track is tolerably direct to very near the head of Hycotee island; then, turning short to the right, it requires great exertion to reach a sluice near the southern shore. Here the navigation may, and ought to be improved, by opening a sluice through the ledge at the head of the island just mentioned, about mid-way of the stream. The openings through all the ledges will then lie in a direction very easy to pass. Below these ledges, all the improvement that can be made, is to collect the water in sluices, and swell it in height, by wings as before described. Of these there will be many; but as this arm is narrow, they will be short. The fall being great, the ascent will, of course, be always laborious. In low water, boats must ascend by the same track in which they pass down; but in high water, they will ascend with less difficulty between the island and the northern shore. There are several small islands above the principal one. The whole length of these falls is one and ¾ miles, and just above the head of them, this mile ends. The mark is on a sycamore; whence to the mouth of Peters's creek, the whole fall is 12 89 feet.

I estimate the cost of improving the navition for the last 2 miles, in the manner stated, 1,100 00

The 74th mile affords excellent navigation. The mark is on a birch.

The 75th mile:—in the first part of this mile, the navigation is still good, but in the latter part, the river becomes wide and shallow. Nothing to mark on.

The 76th mile:—the river continues rather shallow to the end of this mile, which is a short distance above the mouth of Ban-

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Carried forward—Fall, 35.64 feet, cost $ 3,375 00

Brought forward—Fall, 35.64 feet, cost $3,375 00

nister river. The mark is on a beach. It is very uncertain what may be the cost of the necessary improvements in the two last miles; probably 300 00

The 77th mile affords excellent navigation. The mark is on a sycamore.

The 78th mile, navigation the same. The mark is on a sycamore.

The 79th mile, navigation the same. At 118 perches is Torian's ferry, where we cross over with our levelling and survey, to the south side of the river, and whence to the end of the 73d mile, the whole fall is 5.61 feet. At the end of the mile, nothing to mark on.

The 80th mile—In this mile is Boyd's fish dam, which at present is hard to ascend, and about 100 yards of shallow water. It can easily be improved by a graduated sluice from the ledge, and two short low wings to turn in the water. The cost may be 100 00

Then good navigation to the end. The mark is on a sycamore.

The 81st mile affords good navigation. Nothing to mark on.

The 82d mile, navigation the same. Nothing to mark on.

The 83d mile—In this mile are Boston's shoals. The water is brisk and shallow, for about a quarter of a mile, but there is not much fall. It will require a few short wings, and perhaps a short sluice at the lower end. The cost may be 150 00

The river is here, about 100 yards wide. The mark is on a sycamore.

The 84th mile affords good navigation. The mark is on a sycamore.

The 85th mile—In this mile, there is a small ledge where very little improvement may be necessary. Nothing to mark on.

The 86th mile affords good navigation. The mark is on a sycamore.

Carried forward—Fall, 41.25 feet, cost $3,925 00

Brought forward—Fall, 22.75 feet, cost $ 1,275 00

hazardous near the head, with a deficiency of depth in dry seasons, in most places. In descending, the pass is made crooked and dangerous by a few rocks just above the entrance through the principal ledge. These rocks ought to be removed. The track is tolerably direct to very near the head of Hycotee island; then, turning short to the right, it requires great exertion to reach a sluice near the southern shore. Here the navigation may, and ought to be improved, by opening a sluice through the ledge: at the head of the island just mentioned, about mid-way of the stream. The openings through all the ledges will then lie in a direction very easy to pass. Below these ledges, all the improvement that can be made, is to collect the water in sluices, and swell it in height, by wings as before described. Of these there will be many; but as this arm is narrow, they will be short. The fall being great, the ascent will, of course, be always laborious. In low water, boats must ascend by the same track in which they pass down; but in high water, they will ascend with less difficulty between the island and the northern shore. There are several small islands above the principal one. The whole length of these falls is one and ¾ miles. and just above the head of them, this mile ends. The mark is on a sycamore; whence to the mouth of Peters's creek, the whole fall is 12 89 feet.

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The 76th mile:—the river continues rather shallow to the end of this mile, which is a short distance above the mouth of Ban-

Carried forward—Fall, 35.64 feet, cost $ 3,375 00

Brought forward—Fall, 35.64 feet, cost $3,375 00

nister river. The mark is on a beach. It is very uncertain what may be the cost of the necessary improvements in the two last miles; probably 300 00

The 77th mile affords excellent navigation. The mark is on a sycamore.

The 78th mile, navigation the same. The mark is on a sycamore.

The 79th mile, navigation the same. At 118 perches is Torian's ferry, where we cross over with our levelling and survey, to the south side of the river, and whence to the end of the 73d mile, the whole fall is 5.61 feet. At the end of the mile, nothing to mark on.

The 80th mile—In this mile is Boyd's fish dam, which at present is hard to ascend, and about 100 yards of shallow water. It can easily be improved by a graduated sluice from the ledge, and two short low wings to turn in the water. The cost may be 100 00

Then good navigation to the end. The mark is on a sycamore.

The 81st mile affords good navigation. Nothing to mark on.

The 82d mile, navigation the same. Nothing to mark on.

The 83d mile—In this mile are Boston's shoals. The water is brisk and shallow, for about a quarter of a mile, but there is not much fall.. It will require a few short wings, and perhaps a short sluice at the lower end. The cost may be 150 00

The river is here, about 100 yards wide. The mark is on a sycamore..

The 84th mile affords good navigation. The mark is on a sycamore.

The 85th mile—In this mile, there is a small ledge where very little improvement may be necessary. Nothing to mark on.

The 86th mile affords good navigation. The mark is on a sycamore.

Carried forward—Fall, 41.25 feet, cost $3,925 00

Brought forward—Fall, 22.75 feet, cost $ 1,275 00

hazardous near the head, with a deficiency of depth in dry seasons, in most places. In descending, the pass is made crooked and dangerous by a few rocks just above the entrance through the principal ledge. These rocks ought to be removed. The track is tolerably direct to very near the head of Hycotee island; then, turning short to the right, it requires great exertion to reach a sluice near the southern shore. Here the navigation may, and ought to be improved, by opening a sluice through the ledge at the head of the island just mentioned, about mid-way of the stream. The openings through all the ledges will then lie in a direction very easy to pass. Below these ledges, all the improvement that can be made, is to collect the water in sluices, and swell it in height, by wings as before described. Of these there will be many; but as this arm is narrow, they will be short. The fall being great, the ascent will, of course, be always laborious. In low water, boats must ascend by the same track in which they pass down; but in high water, they will ascend with less difficulty between the island and the northern shore. There are several small islands above the principal one. The whole length of these falls is one and ¾ miles. and just above the head of them, this mile ends. The mark is on a sycamore; whence to the mouth of Peters's creek, the whole fall is 12 89 feet.

I estimate the cost of improving the navition for the last 2 miles, in the manner stated, 1,100 00

The 74th mile affords excellent navigation. The mark is on a birch.

The 75th mile:—in the first part of this mile, the navigation is still good, but in the latter part, the river becomes wide and shallow. Nothing to mark on.

The 76th mile:—the river continues rather shallow to the end of this mile, which is a short distance above the mouth of Ban-

Carried forward—Fall, 35.64 feet, cost $ 3,375 00

Brought forward—Fall, 35.64 feet, cost	$ 3,375 00
nister river. The mark is on a beach. It is very uncertain what may be the cost of the necessary improvements in the two last miles; probably	300 00
The 77th mile affords excellent navigation. The mark is on a sycamore.	
The 78th mile, navigation the same. The mark is on a sycamore.	
The 79th mile, navigation the same. At 118 perches is Torian's ferry, where we cross over with our levelling and survey, to the south side of the river, and whence to the end of the 73d mile, the whole fall is 5.61 feet. At the end of the mile, nothing to mark on.	
The 80th mile—In this mile is Boyd's fish dam, which at present is hard to ascend, and about 100 yards of shallow water. It can easily be improved by a graduated sluice from the ledge, and two short low wings to turn in the water. The cost may be	100 00
Then good navigation to the end. The mark is on a sycamore.	
The 81st mile affords good navigation. Nothing to mark on.	
The 82d mile, navigation the same. Nothing to mark on.	
The 83d mile—In this mile are Boston's shoals. The water is brisk and shallow, for about a quarter of a mile, but there is not much fall.. It will require a few short wings, and perhaps a short sluice at the lower end. The cost may be	150 00
The river is here, about 100 yards wide. The mark is on a sycamore..	
The 84th mile affords good navigation. The mark is on a sycamore.	
The 85th mile—In this mile, there is a small ledge where very little improvement may be necessary. Nothing to mark on.	
The 86th mile affords good navigation. The mark is on a sycamore.	
Carried forward—Fall, 41.25 feet, cost	$ 3,925 00

Brought forward—Fall, 41.25 feet, cost $3,925 00

The 87th mile—In this mile there is a small shoal, on which the water will require swelling by wings. This improvement may cost 130 00

At 268 perches is Marseilles ferry, which we cross over with our levelling and survey to the north side, and whence to Torian's ferry the whole fall is 8.76 feet. At the end of the mile, there is nothing to mark on.

The 88th mile—In this mile a shoal occurs, below and opposite to an island, with a fish dam at the head. A proper opening must be made through the fish dam, or it must be entirely removed, and the water below swelled. Its cost need not exceed 150 00
The mark is on an ash.

The 89th mile affords good navigation. The mark is on an elm.

The 90th mile, navigation the same. The mark is on a sycamore.

The 91st mile—At 234 perches is Chappell's ferry, whence to Marseilles ferry the whole fall is 5.51 feet. There is a very small shoal just below the ferry, and a ledge at a fish trap just above, near the end of the mile. At a ledge a graduated sluice for a short distance is necessary, and a little swelling on the shoal below. The cost for the whole may be 125 00
The mark is on a white oak.

The 92d mile affords good navigation. Nothing to mark on.

The 93d mile: navigation the same, except one or two very small shoals. The mark is on a sycamore.

The 94th mile—a considerable part of this mile is wide and very shallow. When the river is low, a good deal of swelling will be necessary. Nothing to mark on.

The 95th mile begins with the same shoals mentioned in the last mile, which continue about ¼; the navigation is then good to the end. These are called the Ruddy Bottom s. The improvements, necessary to

ried forward—Fall, 55.52 feet, cost $3,330 00

Brought forward—Fall, 55.52 feet, cost $ 3,330 00

give sufficient depth on them at all times, will probably cost 250 00

Nothing to mark on.

The 96th mile affords good navigation. Nothing to mark on.

The 97th mile, navigation the same. The mark is on a large sycamore, just below a sharp bend in the river.

The 98th mile, navigation the same. The mark is on a large sycamore.

The 99th mile, navigation the same. Near the end is Carter's ferry; whence to Chappell's ferry, the whole fall is 12.95 feet. Nothing to mark on.

The 100th mile, navigation the same. Nothing to mark on.

The 101st mile—Near the beginning are the double creeks, where the water is swift, but so confined as to have sufficient depth; the navigation is then good to the end. The mark is on a sweet gum on the bank.

The 102d mile affords good navigation, except in one place, where the water is very swift for a short distance, but always tolerably deep. The mark is on a sycamore.

The 103d mile affords good navigation. Nothing to mark on.

The 104th mile, navigation the same. The mark is on a sycamore.

The 105th mile, navigation the same. The mark is on a white oak, on the bank at Stamp's ferry, (called the Horse-pond,) where we cross over with our levelling and survey to the south side of the river, which is here 120 yards wide, and whence to Carter's ferry the whole fall is 3.75 feet.

The 106th mile, navigation the same. The mark is on a beech.

The 107th mile, navigation the same. Nothing to mark on.

The 108th mile—The Milton shoals commence near the end of this mile, which is just above the mouth of County-line creek.

Carried forward—Fall, 71.22 feet, cost $ 3,580 00

Brought forward—Fall, 71.22 feet, cost $ 3,580 00

Nothing to mark on. From the foot of the Milton shoals to Stamp's ferry, the whole fall is 3.38 feet.

The 109th mile commences with the same shoals, which continue near ¼ of a mile above the mouth of the creek. From the tail-race of a mill, partly built, to the foot of the shoals, the fall is 2.09 feet; and from the head of the falls, intended to be used for the mill, to the said tail-race, the fall is 4.22 feet. Considerable expense has already been incurred at this mill, and a great interest is felt by the owners, and by the inhabitants of the town, for its success. It happens, however, that the mill and dam will occupy the ground on which the sluice ought to be made. There is a very small island opposite to the mill site; on the north side of which, those who are interested in the mill suppose a sluice can be made; but it is in the convex shore, and has the appearance of being liable to be filled with gravel; and, in its present state, the water is much too shallow. If, however, the dam was made tight, and so high as to swell the water one foot higher than at present, for an entrance (it must be narrow) at the head of the island, a few low wings might perhaps give sufficient depth; but it would not materially diminish the liability to its being obstructed by gravel. Moreover, I think it is highly probable that, when the river is very low, if the mill were kept constantly at work, it would not leave water sufficient for navigation on the opposite side of the island. I believe the only plan, by which a mill can be maintained, without danger of injuring the navigation, is by erecting a lock of 4 feet lift. For improving the navigation in this mile, and part of the last, by removing a part of the present wall intended for a dam, clearing away some obstructions, and making some wings for swelling, and deepening the water, the cost will probably be 500 00

Carried forward—Fall, 80.91 feet, cost $4,800 00

Brought forward—Fall. 80.91 feet, cost $4,300 00
The mark is on a birch. To the head of the island, the fall is 3.40 feet. At the end of this mile, we cross over, with our levelling and survey, to the north side of the river.

The 110th mile—Near the beginning are Sanders' falls and mill, where there is at present about 3 feet fall in less than 200 yards. The sluice now there is dangerous to descend at a certain stage of the water, and in some places hard to ascend. The most effectual mode of improvement will be to construct a towing wall in the stream at a suitable distance from the upper end of the dam wall, continuing it either straight or slightly curved, the concave side toward the southern shore, quite below the mill. A slight wing or two may be necessary to preserve depth along the wall, which should be 2½ to 3 feet above low water, and 4 feet wide on the top, covered with large stones. The cost of this improvement may be 450 00
The mark is on a sycamore.

The 111th mile affords good navigation. The mark is on a sycamore.

The 112th mile, navigation the same. The mark is on a sycamore.

The 113th mile contains a short shoal, (at an old fish-trap) where the water will require a little swelling or sluicing. The cost may be 120 00
Then good navigation to the end. Nothing to mark on.

The 114th mile has, for a short distance, some swift water, which may require a little work. The mark is on a sycamore.

The 115th mile affords good navigation. The mark is on a black oak.

The 116th mile, navigation the same, with the exception of a shoal at Wilkinson's fish-trap, near the end, where the fall is probably nearly two feet in 150 yards. Some improvement is necessary in the upper ledge, and in the lower one, a graduated sluice, 200 feet long. The cost would probably be 150 00

Carried forward—Fall, 95.63 feet, cost $4,800 00

Brought forward—Fall, 95.63 feet, cost	$ 4,800 00
From the foot of this shoal to the end of the 109th mile, the whole fall is 8.32 feet. Nothing to mark on. The 117th mile—near the beginning is some swift water; but, in the present state of the river, it is not known whether any improvement will be necessary. In this mile, also, are the Hogan's creek falls, where the navigation is rendered extremely difficult and hazardous by fish-traps; one, or more of them must be removed, and a graduated sluice constructed, at least 100 yards long. The cost may be	150 00
Nothing to mark on. The 118th mile—In a considerable part of this mile the water is brisk, and, in dry seasons, certainly too shallow. It will require swelling almost the whole distance. The cost will probably be	200 00
The mark is on a lare apple tree, near Pass-landing. The 119th mile affords tolerable navigation; but, it is probable that, in some places, the water is rather shallow in dry seasons. Nothing to mark on. The 120th mile—Near the commencement, occurs a fall, called the Jack bar. At the first ledge are two fish traps; one of them injurious to the navigation; it must be removed, and, in its place, there must be a long graduated sluice. The water is then wide and shallow for a few hundred yards to another ledge, where the passage is again impeded by other fish traps, and will require considerable improvement.. Then to the end of the mile, a little way below the lower point of the largest island, the current is brisk and the water shallow. The improvements necessary to give, at all times, sufficient depth, and to render the passage safe and tolerably easy, will probably cost	450 00
From the termination of this mile to the foot of Wilkinson's shoal, the whole fall is 12.61 feet. Nothing to mark on.	
Carried forward—Fall, 116.56 feet, cost	$ 5,600 00

Brought forward—Fall, 116.56 feet, cost $ 5,600 00

The 121st mile is, most of it, on swift and shallow water. The present boat passage is between Wilson's island and the southern shore. The course must be straightened, and, in some places deepened, and the water swelled above the head of the island, where the river is very wide. The plan of improvement will be the same as that proposed for similar places below. The cost will probably be 500 00

Nothing to mark on.

The 122d mile affords the same kind of navigation as the last, as far as the bridge at Danville, which is 260 perches from the beginning. The upper part of this shallow water is called Danville shoals. The improvements necessary for this mile, as far as the bridge, will probably cost 450 00

From the bridge to the end of the 120th mile, the whole fall is 17.76 feet. The mark is on a sweet gum, 60 perches above the bridge.

The 123d mile includes the Great Falls of Danville, except 60 perches of the lower end included in the mile below. The whole fall appears to be 21.87 feet, distributed as follows: From the second small branch above, to the head of the canal, the fall is 2.81 feet; thence to the lower end of the canal at the flour mill, 0.16 of a foot; thence to the tail-race of the said mill, 17.73 feet; and thence to the foot of the falls, 1.17 feet. If a sluice navigation should be attempted through these falls, there should be, on the north shore, a towing way from the smooth water above the large ledge to near the bridge, along-side of which, the bottom must be levelled, and the water confined by a low parallel wall where necessary. The whole must be well graduated, and wings constructed wherever they may be requisite.

If the canal is to be used, a boat way ought to be cleared near the shore. For some dis-

Carried forward—Fall, 145.87 feet, cost $ 6,

Brought forward—Fall, 145.87 feet, cost $6,550 00

tance above the entrance, the canal should be enlarged, and the dam raised, so as to give at least 1 foot more water. At the lower end, the site is favorable for locks. Two will be necessary, each of nearly 9 feet lift; a guard lock at the entrance, and two good wastes. It might have been better to have taken out the canal from a point somewhat higher up the river; but under present circumstances, I think, it would not be right to alter its position now. The cost of making these falls passable, by means of sluice navigation, would probably be $3,000; by means of the canal enlarged, and locks of wood, $6,000; of wood and stone, $12,000; of cut stone, and best workmanship, $22,000. If this were part of a continued independent canal navigation along the whole river, the last estimate alone would be admissible; but as it is connected with stream navigation in other places, perhaps the estimate for wooden locks would be most expedient now. We will therefore state the cost 6,000 00

The mark is on a black oak.

The 124th mile requires a little improvement near the lower end, but mostly affords tolerable navigation. At 58 perches is Wilson's ferry, where we return again with our levelling and survey to the north side of the river, having crossed over to the south side at Danville bridge, and whence to the head of the Great Falls, the fall is 1.24 feet. The mark is on a sycamore.

The 125th mile affords mostly good navigation, but towards the end is a shoal 150 yards long, with some fish traps. A sluice must be made in the most eligible part. It may cost 150 00

The mark is on a large sycamore.

The 126th mile begins with good navigation, but the current soon becomes swift, and the water in some places, shallow. The ne-
ry improvement may cost
ng to mark on.

rried forward—Fall, 147.11 feet, cost

Brought forward—Fall, 147.11 feet, cost $ 12,800 00

The 127th mile commences with the long shoal. The two lower-most ledges are abrupt and hard to ascend, and dangerous to descend. From the top of the second ledge in this mile to Wilson's ferry, the fall is 20.15 feet: 5 or 6 feet of this fall belong to the two last ledges. The current is then rapid to the end. Nothing to mark on.

The 128th mile—the shoal continues to about the middle of this mile; the water is then deep to the end. From the head of the shoal to the top of the second ledge in the last mile, the fall is 8.57 feet. The shoal must be improved by clearing a boat-way along the southern shore, from near the head of the shoal, to the foot. Towing walls will probably be required for short distances at the lower edges, and graduated sluices at several places. I estimate the cost of the improvements necessary for this shoal, 900 00
Nothing to mark on.

The 129th mile affords good navigation. Nothing to mark on.

The 130th mile affords some good navigation, some rocks with deep water between them, and some ledges to sluice. The mark is on a walnut, on the bank.

The 131st mile has, for about 200 yards, the same kind of bed, then good navigation, and then another shoal. The shoal below must have a boat-way opened near the northern shore, and both shoals will require some sluicing. We may estimate one to cost 200 00

And the other, 150 00
Nothing to mark on.

The 132d mile has mostly brisk water, with a number of detached rocks and lumps on the fixed ones. To make good navigation, th[illegible] must be clearing away and some slui[illegible] may cost 150 00
T[illegible] a sycamore.

[illegible] affords good navigation.
N[illegible] on.

[illegible] cost $ 14,200 00

Brought forward—Fall, 175.83 feet, cost $ 14,200 00

The 134th mile includes Adams's island, some small shoals, one ledge and several fish traps. The necessary improvements will probably cost . 100 00
Nothing to mark on.

The 135th mile affords good navigation. Nothing to mark on.

The 136th mile includes in its upper half, two or three small rapids, which may require such improvements, as to cost about 75 00
Nothing to mark on.

The 137th mile affords nearly all good navigation. Nothing to mark on.

The 138th mile, most excellent navigation. Nothing to mark on.

The 139th mile, navigation the same. The mark is on a large hickory, 100 yards above Daniels' ferry.

The 140th mile affords tolerable navigation. There are a few places where the current is swift, but there is very little, if any deficiency of depth. No improvement is necessary at present. Nothing to mark on.

The 141st mile is similar to the last, and the same remarks are applicable. The mark is on a sycamore.

The 142d mile begins with a fall, called the Wreck. The present passage is very rapid and hard to ascend. It is situated near the northern shore. A boat-way ought to be cleared near the southern shore, and a graduated sluice made at the ledge. For some distance above, the water continues swift, with rocks under the surface. For a considerable part of this mile, the boatway ought to be cleared near the southern shore; a few wings may be necessary to give depth. The cost of these improvements will probably be 200 00
The mark is on a large sycamore.

The 143d mile affords good navigation. The mark is on a red oak.

The 144th mile contains, near the upper end, a ledge and "Broad-mouth shoal," with

Carried forward—Fall, 175.83 feet, cost $ 14,575 00

Brought forward—Fall, 175.83 feet, cost $14,575 00

a fish trap. The present passage is crooked, dangerous and very hard to ascend; but here a graduated sluice may easily be made, and will probably cost 75 00

Nothing to mark on.

The 145th mile affords good navigation. Nothing to mark on.

The 146th mile, navigation the same. The mark is on a sycamore.

The 147th mile begins with a ripple, where very little improvement is necessary. For the remainder, the navigation is good. The mark is on a sycamore.

The 148th mile contains the Indian shoal, where there is 2 feet fall in a few lengths of the boat; very safe and easy to descend, at all stages of the water, but extremely hard to ascend. For the purpose of ascending, a sluice and towing way ought to be made close to the northern shore; the cost of which may be 200 00

The 149th mile contains two ledges, both easy and safe to descend; but the upper one hard to ascend. A graduated sluice (100 yds. long) ought to be made close to the northern shore, or a short towing way. The cost of the necessary improvements, at both ledges, may be 75 00

Nothing to mark on.

The 150th mile contains some ledges, and ends just at the head of one where there is nothing to mark on. At one of these ledges there is an old fish trap, and a wall, which injure the navigation. The cost of improving this mile may be 50 00

The 151st mile affords good navigation. Near the end, Smith's creek enters from the north.

The 152d mile—The navigation is tolerable. The mark is on a sycamore, 30 perches above the landing at Leaksville, whence to the head of Long shoal, 25 miles, the whole fall is 56.49 feet.

Carried forward—Fall, 232.32 feet, cost $14,955 00

Brought forward—Fall, 232.32 feet, cost $14,975 00

The 153d mile, navigation the same. The mark is on a sycamore close to Matrimony creek.

The 154th mile, navigation the same. The mark is on a Spanish oak.

The 155th mile affords excellent navigation. Nothing to mark on.

The 156th mile—The water is rather shallow in a few places. Some improvement will also be required at two fish traps. The whole cost may be 100 00
The mark is on a black oak; whence to Leaksville, the whole fall is 7.35 feet.

The 157th mile affords, nearly all of it, very good navigation, and no part bad. The mark is on a Spanish oak.

The 158th mile contains one or two places which will require slight improvements. The cost may be 25 00
The mark is on a sycamore.

The 159th mile affords tolerable good navigation. The mark is on a sycamore.

The 160th mile, towards the end, has some swift water. The mark is on a sycamore, at the village of Jackson. From the foot of the tail-race, at this village, to the end of the 156th mile, the whole fall is 11.96 feet. In the last two miles, some improvements will be necessary, which will probably cost 75 00

The 161st mile begins at the foot of the Eagle falls, where the river descends 2.81 feet in less than 200 yards. There is at present a mill building at the spot, which will probably interfere with the navigation. A graduated sluice may be made to answer tolerably well; but a towing wall, about 40 feet in length, will answer much better. For these falls, the best kind of improvement, constructed in the best manner, will probably cost 500 00
For the remainder of this mile there is no difficulty. The mark is on a white oak.

Carried forward—Fall, 254.44 feet, cost $15,675 00

Brought forward—Fall, 254.44 feet, cost	$ 15,675 00
The 162d mile contains the Dead-timber shoal, which will require a little improvement. The cost will be perhaps	25 00
For the remainder of the mile, the navigation is excellent. The mark is on a white oak.	
The 163d mile affods excellent navigation. Nothing to mark on.	
The 164th mile contains Mulberry-island shoal and fish-trap; at present hard to ascend. A new sluice must be made nearer to the southern shore, which, if well graduated, will make the ascent easy. The cost may be	50 00
The mile ends opposite to the island, but is not marked.	
The 165th mile includes a little of the upper part of the last mentioned shoal. No improvement appears to be necessary. For the remainder of this mile, the navigation is good. Nothing to mark on.	
The 166th mile contains two or three little shoals, which may require some labor. The necessary improvements for this mile may cost	50 00
The mark is on a sycamore, opposite to Alexander Henderson's house.	
The 167th mile contains several shallow places about the Three Islands. For this mile, the necessary improvements will probably cost	75 00
The mark is on a small sycamore, a little way above Allen's ford.	
The 168th mile affords good navigation, except one spot, where the water is rather shallow. Nothing to mark on.	
The 169th mile—Mostly good navigation; but toward the end, occurs the foot of Slink falls, whence, to the foot of the Eagle falls, at the village of Jackson, the whole fall is 19.06 feet. In Slink falls, the river descends 4.60 feet in about 80 perches. Here a very safe descending may be made for $ 50, but it	
Carried forward—Fall, 275.29 feet, cost	$ 15,875 00

Brought forward—Fall, 275.29 feet, cost	$ 15,875 00
would be rather hard to ascend with loading; to make it easy for this purpose, will require a towing-wall, about 100 feet long, which, with cleaning, &c. would probably cost	300 00
The mark is on a sycamore, just above the upper ledge, called the Cross rock.	
The 170th mile contains a ledge and fish dam. A graduated sluice on the northern side is the proper kind of improvement here. If well made, it may cost	50 00
This mile ends 70 perches above the mouth of Mayo river. The mark is on a large beech, opposite to the village of Madison.	
The 171st mile contains, near the beginning, at the ford, a shoal which will require some improvement, and perhaps a little may be necessary at another place. For the whole mile, the cost may be	40 00
Nothing to mark on.	
The 172d mile requires very little, perhaps no improvement. It ends a short distance below the Beaver-island shoal.	
The 173rd mile begins near the foot of Beaver island shoals. At these shoals the river descends about 4 feet in 300 yards. At one place it is hard to ascend; and rather shallow for loaded boats in two or three places. It may be improved, on the north side, for a small sum, (say $ 50,) so as to make a tolerable navigation. But to make it as perfect as circumstances will permit, there should be constructed, near the southern shore, a towing way 150 yards long at least; and near the end is a small fall, which may need a little improvement. The cost may be stated	300 00
The mark is on a post-oak, just above the falls.	
The 174th mile affords tolerable navigation. The mark is on a walnut.	
The 175th mile contains, near the beginning, a ledge and fish dam hard to ascend, but may easily be made tolerable by opening	
Carried forward—Fall, 275.29 feet, cost	$ 16,565 00

Brought forward—Fall, 275.29 feet, cost $16,565 00

and graduating a sluice close to the northern shore. There is, also, another fish dam, where very little more is necessary than to remove a part of the wall. These improvements may cost 50 00

All the remainder of this mile is deep water. Nothing to mark on.

The 176th mile affords mostly good navigation. A few trifling improvements may be necessary. The mark is on an ash.

The 177th mile contains a long gravel shoal, where there is less depth than we have had before. It requires a few wings and sluice walls. The cost may be 60 00

For the remainder of the mile, the navigation is tolerable. The mark is on a black oak, just below Dearing's fish trap.

The 178th mile includes, at the beginning, Dearing's fish trap, where, to enable our boat to pass, we were obliged to take down the wall; but little more will be necessary. There is, also, another fish dam; the trap may be removed and a sluice made at the place, which may be done for a very trifle; say 25 00

Nothing to mark on.

The 179th, 180th, 181st, 182nd, 183rd, 184th, and 185th miles were surveyed, from Peter Hairston's ford, 36 perches above the termination of the 185th mile, downward to meet the end of the 178th mile; and not knowing, as we proceeded, how the survey would close, as to distance, of course these 7 miles could not be marked.

Having just entered the 179th mile, we were prevented by rain, from proceeding with the survey, and the captain being very sick, we ascended the river in the boat, to Peter Hairston's. Here, having found that there is very little prospect of improving the navigation to any higher point on the river, at least for some years to come, we next morning commenced our return with the level.

Carried forward—Fall, 275.29 feet, cost $16,70

Brought forward—Fall, 275.29 feet, cost $ 16,700 00
ling and survey, which we connected with our former work at the end of the 178th mile, having found the distance to be 7 miles and 36 perches. Should it, however, be thought expedient to attempt an improvement of the river for navigation higher than Hairston's ford, it may be useful to state the fact, that there is a sufficiency of water when confined in sluices, but it will be rapid, and there are some rocky falls, which increase as the mountain is approached.

In the last 7 miles, (from the end of the 178th, making the whole distance from Rocklanding 185 miles,) there are 6 to 8 fish dams, through several of which we were obliged to break. There are, also, some places where the current is swift, and the water too shallow when the river is very low. There was, however, every where, sufficient depth for a boat carrying 4 hogsheads, and the water was said to be quite as low this season as usual. I think that for this distance a good navigation will not cost more than $ 60 per mile.

7 miles at $ 60, 420 00

From Peter Hairston's ford, to the foot of the Slink falls, the whole fall is 6.78 feet. The distance on Dan river, from Clarksville to Peter Hairston's ford, is 125 miles. The fall in that distance is 277 feet, and 47 hundredths of a foot.

The whole distance on Dan and Roanoke rivers, from Peter Hairston's ford to the head of the canal at Rocklanding, is 185 miles. The whole fall of the rivers in that distance, is 434 feet.

The amount of estimates of the probable cost, of the proposed improvements on Dan river, 125 miles, $ 136 96 per mile, $ 17,120 00

Note.—Since our passage up the river, the low water sluice on Wortham's land, 8 miles above Clarksville, is, for some distance, quite impassable by the falling of a number of trees across it.

STAUNTON RIVER.

Having returned from our survey of the Dan, and after being detained two days on account of sickness amongst our hands, we commenced from Clarksville, our ascent of Staunton river, so numbering the miles as to denote the distance from Rocklanding.

The 61st mile is, most of it, nearly 200 yards wide, with detached rocks spread over the bottom. To give sufficient depth, when the river is low, it will be necessary to clear a boat-way, and perhaps to swell the water a little in some places. These operations may cost $100 00

Nothing to mark on.

The 62d mile requires less improvement than the preceding. It is not quite so wide. The necessary improvement may cost 50 00

The mark is on a large sycamore, on the north side of the river, the side on which the survey is carried.

The 63d mile is mostly favourable for navigation, but near the end there are some rocks through which there is no good passage. The most natural place to make one, is close to the northern shore, but it is at present very much filled by trees, which have been cut from the bank. The cost proper for this mile, will probably be 50 00

The mark is on a sycamore, at the mouth of Mill creek.

The 64th mile affords good navigation. The mark is on a sycamore.

The 65th mile, navigation the same. Nothing to mark on.

The 66th mile has mostly a sufficient depth of water, but there are many rocks. A regular boat way must be opened; which opera-

Carried forward, cost $200 00

Brought forward—cost $ 200 00

tion will probably cost $ 100. The mark is on a sycamore, opposite to a large old barn, on the south side of the river.

The 67th mile is, for a small distance in the beginning, similar to the last; it is, however, generally narrow, and affords good navigation. Toward the end, the width of the river has diminished to about 80 yards. Nothink to mark on.

The 68th mile has good navigation as far as Abbyville, (which is on the north side of the river, at 122 perches from the beginning of this mile,) whence to Clarksville the whole fall is 10.43 feet. At 186 perches, we cross over with our levelling and survey, from the north side to the lower point of Harris's island, which point is opposite to the mouth of the upper Thouroughfare. From Abbyville to this place, is a shoal, to improve which for low water, will probably require an expenditure of 75 00

Then the navigation is good to the end of the mile. The mark is on an ash, on Harris's island.

I think there is no doubt, that instead of improving the lower section of this river, as already described, (or rather *in addition* to those improvements,) the upper Thouroughfare ought to be opened so as to make the navigation good into the Dan river, a distance of about 600 yards, which can be done for a small sum, probably not more than 100 00

The 69th mile begins at the foot of Tally's falls. Through the lower ledge, the navigation is, at present, entirely destroyed by fish dams and fish traps. Every opening between the rocks, where boats might have passed, in the natural state of the river, is closed, either by a trap, or by a wall to turn the water into a trap, or it is rendered entirely useless by the ruins of former works of this kind. On these falls, the water is expanded from 200 to 300 yards wide, and is, of course, very shal-

rried forward—Fall, 10.43 feet, cost $ 375 00

Brought forward—Fall, 10.43 feet, cost $ 375 00

low. Rocks, both fixed and detached, lie in all parts, so that it was with extreme difficulty we could find depth sufficient for our boat. At the upper ledge, near the head of the falls, there is another line of traps and walls across every opening through which a boat can float. Even in the present condition of the river, our's was dragged, by the help of many hands, through a little rugged notch made by the fishermen, close to the shore. From the termination of this mile to Abbyville, the whole fall is 15.23 feet. The mark is on a chinquepin-oak, on the south side of the river, near the head of the falls. From the upper end of Harris's island, at 270 perches, we had crossed over to the south side with our work.

The 70th mile has a swift current, for a little way, in the beginning, the upper end of Tally's falls; the navigation is then tolerable to the end.

To make a good navigation through these falls, in a low state of the river, it will be necessary to clear a way, for more than a mile, near the southern shore, sometimes at a short distance from it, and at other places contiguous, so as to make it regular and easy to be passed. At the two principal ledges, it will probably be necessary to erect towing walls, for perhaps 200 feet at each place; also, several wings to turn in the water, and probably several sluices, confined on both sides. I suppose the cost will not be less than 2,000 00

The 71st mile has, most of it, good navigation; but toward the end, it becomes rocky and shallow, with some ripples. For opening a boat way, some expense must be incurred, perhaps 100 00

The mark is on a sycamore.

The 72d mile is, for the first half, similar to the latter part of the last mile; the river is about 300 yards wide. The cost of the necessary improvement may be [illegible] 00

Carried forward—Fall, 25 [illegible], cost [illegible]

Brought forward—Fall, 25.66 feet, cost $ 2,600 00

For the remaining half of this mile, the navigation is good. At the end, Difficult creek enters.

The 73d mile affords excellent navigation. The mile ends about 60 yards below Blank's ferry. Nothing to mark on.

The 74th mile, navigation the same. The mark is on a large sycamore.

The 75th mile, navigation the same. Nothing to mark on.

The 76th mile, navigation the same. Nothing to mark on.

The 77th mile, navigation the same. Ends 32 perches below Moseby's mill. No mark.

The 78th mile commences at the foot of a considerable fall made in part by Moseby's mill dam. In about 200 yards the fall is 3.61 feet. If the dam be kept up, there will be required a graduated sluice more than 100 yards long, at the opposite shore; it is the convex shore, and therefore not so proper for a sluice as the other; yet, I believe a sluice may be so constructed as to keep open. Wings and other short sluices will be necessary, and probably a short towing wall at the head. These works, if the mill be preserved, certainly will not occupy the same ground which they would do if it were removed. To render the way sufficiently easy for ascending boats, the cost will perhaps be 2,000 00

From the head of Moseby's dam to the commencement of this mile, the fall is, as above, 3.61 feet, and thence to the end of the 79th mile, it is 9.42 feet. For the remainder of this mile, above the falls, the navigation is good. Nothing to mark on.

The 79th mile; for a considerable part of it, the river is about 200 yards wide, the current swift, and the water in some places shallow. To increase the depth, there will probably be required wings, which may cost 100 00

Nothing to mark on.

The 80th mile affords tolerable navigation. No mark noted.

Carried forward—Fall, 42.19 feet, cost $ 4,700 00

Brought forward—Fall, 42.19 feet, cost $4,700 00

The 81st mile includes Moseby's mill, where there is about 3½ feet fall in 300 yards. It is possible to make a graduated sluice and preserve it, but it is quite certain that the mill dam near the mill crosses the ground that would be used, if no mill was there. The navigation is injured, unquestionably, by the dam, as it now stands, but the owner appears to be obstinate, and says he will extend his dam still further; so that a small pittance, indeed, will be left for the benefit of navigation, which he affects to think of small importance, compared with his mill. If the mill be suffered to remain, the best sluice that can be made may cost about 300 00

But whenever a breach shall happen, in the dam, near the mill, the water will be drawn away from the sluice just mentioned, and a dam must be erected to turn it in; or if the mill should go down, that sluice must be abandoned and another made in the proper place. Nothing to mark on.

The 82nd mile affords good navigation. Nothing to mark on.

The 83rd mile, navigation the same. Nothing to mark on.

The 84th mile, navigation the same. Nothing to mark on.

The 85th mile, navigation the same. About the middle of the 83rd mile, we crossed over with our levelling and survey to the north side of the river. At 66 perches in this mile is the mouth of Little Roanoke; whence, to the head of Moseby's mill dam, in the 78th mile, the whole fall is 8.52 feet. Nothing to mark on.

The 86th mile has good navigation. Nothing to mark on.

The 87th mile affords good navigation. Nothing to mark on.

The 88th mile, navigation the same for about ¾. The last ¼ has a brisk, and in some places rippling current. There is

Carried forward—Fall, 50.71 feet, cost $5,000 00

Brought forward—Fall, 50.71 feet, cost $5,000 00

generally sufficient depth, and no place hard to ascend. However, to give depth enough at a few ledges, in dry seasons, some labour will be necessary. The cost may be 50 00

The boat way will be near the southern shore. At 148 perches, in this mile, is Clark's ferry.

The 89th mile affords good navigation. Nothing to mark on.

The 90th mile, navigation the same. The mark is on a small sycamore.

The 91st mile has mostly a brisk current, but tolerable navigation. From the middle of this mile, 16 perches below Morton's ferry, to the mouth of Little Roanoke, the fall is 6.55 feet. The mark is on a walnut, on the bank.

The 92d mile has tolerable navigation. Nothing to mark on.

The 93d mile, navigation the same. Nothing to mark on.

The 94th mile affords good navigation. We crossed over with our levelling and survey to the south side of the river. Nothing to mark on.

The 95th mile—In consequence of rain, the river has risen considerably, so as to render it impossible to determine precisely the appearance of its bed in low water. Near the end, the current is strong, with ripples in some places. The mark is on a sycamore.

The 96th mile—For the first half, the current is still strong. I think it probable that contracting and sluicing will be found necessary to produce, in times of low water, sufficient depth on this shoal. The cost may be 150 00

Nothing to mark on.

The 97th mile—The navigation appears to be tolerable. Nothing to mark on.

The 98th mile—The navigation is apparently pretty good. The mark is on a sycamore, on the north side of the river, we having, in the last mile, crossed over with our work.

Carried forward—Fall, 57.26 feet, cost $5,200 00

Brought forward—Fall, 57.26 feet, cost $ 5,200 00

The 99th mile affords good navigation. Nothing to mark on.

The 100th mile, navigation the same. Nothing to mark on.

The 101st mile—The navigation is mostly good; but, from present appearances, for about 200 yards, the water will be rather shallow in dry seasons. It is probable there might be laid out,to advantage 50 00

The 102d mile has good navigation. Nothing to mark on.

The 103d mile, navigation the same, except a little shoal very near the end, where, I think it probable, there will seldom be a deficiency of depth; but the river is now too high to admit of a certain judgment. At 256 perches, we crossed over, with our work, to the lower end of Fuqua's island. The mark is on a sycamore, on the island, just above the head of the shoal.

The 104th mile has tolerable good navigation. It is probable, however, that some small improvement will be requisite about the head of Fuqua's three islands.

The 105th mile, navigation similar to the last; but, near the end, the current is swift, and the water probably shallow in dry seasons. Nothing to mark on.

The 106th mile—The description given for the end of the last mile, is applicable to the first part of this, and the current continues swift; but, from information, very little, if any, expense will be necessary. We will, however, state the cost for the last 4 miles, 150 00
At 134 perches, is Coles's ferry, whence, to the middle of the 91st mile, the fall is 25.21 ft.

The 107th mile affords good navigation. Nothing to mark on.

The 108th mile, navigation the same. Nothing to mark on.

The 109th mile contains a ledge, and a small fish trap, also a fish dam near the end. It is possible a little labor may be necessary

Carried forward—Fall, 51.97 feet, cost $ 3,700 00

Brought forward—Fall, 51.97 feet, cost $ 3,700 00
to turn the water to the principal opening in the ledge, and to remove a part of the wall of the fish dam; but no certain judgment can be formed in the present condition of the river. Nothing to mark on.

The 110th mile affords good navigation, and ends nearly opposite to the mouth of Childree creek. Nothing to mark on. Here we crossed with our work to the south side of the river.

The 111th mile, navigation the same. The mark is on a sycamore.

The 112th mile—At 102 perches is Hairston's ferry, (formerly Booker's,) where we crossed over with our work to the north side of the river, and whence to Coles's ferry, the fall is 8.83 feet. Just above the ferry, is Hairston's fish dam and trap. It does not appear that any material improvement will be necessary. The mark is on a walnut.

The 113th mile—At 198 perches is the mouth of Falling river, and just below it, are Henry's fish dam and trap. In making a graduated sluice here, a small expense will probably be incurred, perhaps 50 00
The mark is on a walnut, just below White Rock falls.

The 114th mile begins at the foot of White Rock falls. These are at present not difficult nor dangerous to descend; but, over the principal ledge, the ascent is hard. A towing wall ought to be extended from a large rock on the southern shore downward about 200 feet, and a graduated sluice for some distance above. For such improvements, the cost may be about 300 00
The navigation is then good to the end of the mile. The mark is on a walnut.

The 115th mile affords good navigation, and ends just below Brookneal, where we crossed with our work to the north side.

The 116th mile contains the Seven Islands falls: at the first ledge will be necessary a graduated sluice, about 250 feet long, and directing wings. Another ledge near the end,

Carried forward—Fall, 60.80 feet, cost $ 4,050 00

Carried forward—Fall, 60.80 feet, cost $4,050 00

will require a towing wall near the middle of the stream, 250 feet long. For the requisite improvements for the whole mile, the cost may be about 450 00

The mark is on a Spanish oak.

The 117th mile contains Jones's falls, from the foot of which to Hairston's ferry, the fall is 18.57 feet, and from the head of Jones's falls to the foot of the same, the fall is 9.51 feet. These falls are extremely difficult and dangerous to ascend or descend. At the first ledge, the fall in the present condition of the river, is at least 3 feet in the distance of 100 yards, and the present pass is very crooked. There are several considerable ledges above that just described, and a swift current between them. Then a brisk and somewhat rippling current is found to the end of this mile. This fall (9.51) feet, is too great for the distance, to make a safe and easy navigation by any means that now occur, other than by a dam on the lower ledge about 6 feet high from the northern shore to the island, with a very short canal on the shore and a lock of 9 feet lift, for which the site is favourable. The dam will be connected with the southern shore, as circumstances may require. Such a dam, canal and lock, will probably cost 12,000 00

The end of this, and the beginning of

The 118th mile is not distinguished in the notes. Nevertheless, the description of the river, indications of requisite improvements, and their probable cost, are continued. Above the principal fall described in the last mile, the river continues very wide and rocky in the bottom for a considerable distance above the islands, through the whole of which, a boat way must be opened, sluices made in some places, and wings to swell the water. These operations up to the smooth deep water at the bend of the river, may cost 300 00

But previous to the commencement of any

Carried forward—Fall, 88.88 feet, cost $16,800 0

Brought forward—Fall, 88.88 feet, cost $16,800 00

improvements in the last mile, and in this, a very careful examination, when the water is low, should be made of the small channels between the islands and the southern shore. It is possible that such a distance may be obtained between these, as will admit of a sluice sufficiently safe, and not too difficult of ascent for profitable use in navigation. Of this there is now no opportunity of judging. About half a mile above the bend, are a fish-dam and traps which make a hard sluice, but the depth being sufficient, the expense of improving will be small. Immediately above this, the river being wide and the current swift, some swelling will be requisite, which may cost 120 00

The 119th mile, toward the end, includes some of Forrest's fish traps, and a swift current, which may require some improvement by clearing the passage, &c. The cost may be stated 100 00
The mark is on a walnut.

The 120th mile has, near the beginning, another fish dam and trap, (Forrest's,) where very little improvement is necessary. Some distance above, are Daniel Journet's fish dams, from the foot of which to the head of Jones's falls, the fall is 17.01 feet. By these dams the navigation is very much injured. The river is wide, and in some places rather shallow. Near the end, commences Journet's falls. The first ledge is very abrupt and dangerous; there is a fall of 3 feet in 100 yards. The present opening through the fish dam is near the northern shore, but the distance is too short for sluicing. On the southern shore a sufficient distance might be had, but there would be a liability of the sluice being filled with gravel. The most eligible plan of improvement will be by a towing wall along the northern shore, to commence at least 150 feet below the first ledge, and to continue above it as far as may

Carried forward—Fall, 105.89 feet, cost $17,020 00

Brought forward—Fall, 105.89 feet, cost $ 17,020 00

be necessary, perhaps 150 feet more. Below the ledge will be required an outer wall, to prevent the spreading of the water. The improvements necessary for the whole of this mile, and to the head of the fall, will probably cost 550 00

The mark is on a spruce, above the principal ledge.

The 121st mile contains, in the beginning, the upper part of the falls just described, of the improvement of which the cost is included in the last estimate. For most of this mile the river is 200 yards wide, and in several places will require wings and swelling. The cost may be 150 00

This mile ends a short distance below the foot of Eckels's falls.

The 122d mile contains the whole of Eckels's falls, and a part of Flat-land falls. The smooth water between these is but for a little space. The river is from 200 to 300 feet wide, and stuck full of rocks. At 170 perches is Collins's ferry, whence, to the foot of Journet's fish traps, the fall is 14 feet. The mark is on a pine.

The 123d mile commences in the Flat-land falls, and terminates Pannill's falls, from the head of which, to Collins's ferry, the fall is 18.18 feet. The mark is on a sweet gum. Between these falls the navigation is good.

To construct such works as will render the navigation safe and convenient, passing Eckels's and Flat-land falls, will be much the most serious undertaking we have yet seen. The length of the two, with the sheet of good water between them, is about 1¼ miles, and in that distance the fall is about 27 feet. A considerable sum of money has already been expended in opening a passage for boats, but the fall is so great in several places, that the ascent can hardly be effected with even half loads; and the descent, in some conditions of the river, must be extremely dangerous.

Carried forward—Fall, 165.07 feet, cost $ 17,720 00

Brought forward—Fall, 165.07 feet, cost $17,720 00

The most eligible plan for improving this part of the river appears to be, to commence a dam at the southern shore. There is a suitable place for it about 200 or 300 yards below the head of the falls, and run obliquely across to the northern shore. The dam should be so high as to swell the water to the head of the falls; then to take out a canal on the southern shore, and continue it to the foot of the falls.

So far, this report has been formed from the notes of the late principal engineer, (together with the notes of the leveller, and those of the surveyor;) but here the notes of the late principal engineer end, without giving his opinion of the probable cost of the improvement proposed by him for Flat-land and Eckels's falls. From his description, however, a pretty good estimate may be formed, of the requisite expense.

The proposed dam, near the head of Flat-land falls, a canal 1¼ miles long, and 3 locks of 9 feet lift each, (27 feet of lockage,) need not, in my opinion, cost more than 27,000 00

The following part of this report and estimates has been formed from notes made by the assistant engineer after the principal engineer had left Staunton river (7th month 10th, 1822,) in order to attend the Potowmac commissioners. The assistant engineer has, in his notes, described the river minutely, but has given no opinion of the probable cost of necessary improvements. I have, with what aid I could derive from the surveyor's notes, and those of the levelling, formed of the necessary expense, the best judgment of which I am capable; but, although the difficulties may be well described, any opinion formed by one who has not actually seen them, of the expenditure requisite to overcome them, must be vague and uncertain. Under these circumstances, and as all the notes of the late principal engineer, of the assistant engineer,

Carried forward—Fall, 165.07 feet, cost $44,720 00

Brought forward—Fall, 165.07 feet, cost of the leveller and surveyor, maps and profiles, are herewith presented, it is believed that every useful purpose will be answered by using a more compendious form of estimating for the remainder of this report. $44,720 00

From the end of the 123d to the end of the 169th mile, where the levelling and notes of the assistant engineer terminate, the distance is 46 miles; of which, 19 require no improvement, and for the remaining 27, the following estimate is offered:

The cost of improving 1 mile will probably be	$ 600 00	
The cost of improving 1 mile will probably be	300 00	
The cost of improving 3 miles, at $ 200 per mile average,	600 00	
The cost of improving 4 miles, at $ 100 per mile average,	400 00	
The cost of improving 18 miles, at $ 60 per mile average,	1,080 00	
Total, 27 miles, cost		$ 2,980 00

In the 125th mile are Corn-row falls, where the river descends about 20 feet, in a quarter of a mile. Here will probably be required a short canal, with a dam at the head, to turn the water in, and two or three locks; to accomplish all which, it is believed the expenditures need not be more than 20,000 00

In the distance of 46 miles, from the end of the 169th to the end of the 123d mile, the whole fall in the river is 157.54 feet, an average of 3.43 feet per mile.

Although the levelling terminated at the end of the 169th mile, the surveyor carried his work 3 miles further, to the middle of the gap through which the river passes Smith's mountain, 172 miles from the head of the canal at Rocklanding.

The distance, on Staunton river, from Clarksville to Pannill's falls, is 63 miles. The fall, in that distance, is 165.07 feet, and the amount of estimates of probable cost	44,720 00
From Pannill's falls to the gap in Smith's mountain, the distance is 49 miles. The fall in the first 46 miles is 157.54 feet; and the amount of estimates,	22,980 00
Whole amount of distance, 112 miles; of fall, 322.61 feet; of estimates,	$ 67,700 00

RECAPITULATION.

The rivers	*Distances.*	*Whole fall.*	*Average fall per mile.*	*Amount of estimated cost of proposed improvements.*
	Miles.	*Feet.*	*Feet.*	
Roanoke, -	60	156.60	2.61	- - $ 25,000 00
Dan, - -	125	277.47	2.22	- - 17,120 00
Staunton, -	109	322.61	2.96	- - 67,700 00
	294			$ 109,820 00

GENERAL REMARKS.

I have endeavored to make this report such, as it is evident from the notes of the late engineer, he intended it should be, plain and practical, preserving his minute and perspicuous description of those parts of the river where improvement is necessary, and pointing out their locality by references to islands, to remarkable objects, and to the mile marks. As far as I could, consistent with those views, I have laboured to be concise; and, (adding very little of my own,) to form the notes of my late excellent friend into such a manual as will be a certain guide and instructor to any person, acquainted with the principles and laws of running streams, and with the modes of erecting hydraulic works, who may be employed to construct the improvements proposed.

Herewith I present the notes:

1. Of Thomas Moore, the late principal engineer.
2. Of Asa Moore, junior, the assistant engineer and leveller; and
3. Of Joseph E. Bentley, the surveyor.

These notes were all made on the spot, at the places to which they relate.

I present, also, three separate maps, each with a profile, exhibiting the fall:

1. One of the Roanoke.
2. One of the Dan; and
3. One of the Staunton rivers.

These maps were projected, in primary drafts, from his field notes, by Joseph E. Bentley—they were lettered, decorated and finished by Herman Boye.

All which is respectfully submitted.

ISAAC BRIGGS.

Richmond, 2nd month 12th, 1823.

CLAUDIUS CROZET'S

REPORTS

ON THE

Slate River, South Branch of Potowmac River, Great Cape Capehon, and Patterson's Creek.

RICHMOND, December 16, 1823.

To the president and directors of the Board of Public Works.

GENTLEMEN,

Pursuant to the resolutions of your honorable Assembly, I examined, during the present year, Slate river, the South Branch of the Potowmac, the Great Cape Capehon, and Patterson's creek. The rest of the season was employed in surveying and exploring for the road between Staunton and Little Kanawha. In addition to these operations, which were directed to take place during the present year, I surveyed the road between Romney and Winchester, thinking that some time might hereafter be saved by it.

I have the honor to address you my reports on these various subjects, and shall soon lay before you the maps which are intended to accompany them.

I am, very respectfully,
Gentlemen,
Your most obedient and humble servant,

C. CROZET,
Principal Engineer.

SLATE RIVER.

I visited this river in the latter part of June. The almost incessant rains which began to fall the very day I arrived there, swelled the stream and rendered it so turbid, that I was deprived of the advantage of judging, by my own observations, of the nature of the bottom, and also, of the state of the stream at low water.

The following facts are the result of the best information I can obtain:

1°. From Buckingham court-house to the head of the first mill, (Hocker's,) the section of water is sometimes so little as 10 feet wide by 6 inches deep; but as the river is narrow, it appears that a rain of one day is sufficient to render it navigable, which procures frequent opportunities for the descent of boats. It is thought that three months in the year is the average of the time during which a navigation of 18 inches would be stopped, if the obstructions were removed. I am inclined to doubt the correctness of this last assertion.

2°. Between Hocker's and Fountain's mills, the river is not well known, and indeed it is difficult to assign it any waterway, for it is a succession of ripples and abrupt falls, over which the water flows with such velocity as to leave it but little depth, even in common floods.

3°. Between Fountain's and Sladen's mills, the section is said to be seldom less than twelve feet wide by one deep.

4°. Below Taylor's mill, the river has been rendered navigable by a dam and gate constructed by Mr. Taylor himself.

5°. None of the mills is ever a whole day without grinding.

Although I did not take a complete level of the whole river, I can conclude, with a sufficient degree of certainty, from partial observations, that the fall is about 6¾ feet in a mile.

From the ford at Buckingham court-house, to the pond of Hocker's mill, the distance is 4¼ miles, and the fall 28.65 feet The mean width, for that distance, is 40 feet.

Besides this, I took the fall at each mill dam. The mill dams on the river are 5 in number, and form as many ponds, which occupy an aggregate of about 10 miles of the total length of the river. The heights of these dams are as follow:

Hocker's, - - -	10.25 feet,
Chambers's, - - -	11.20
Fountain's, - - -	12.59
Sladen's, - - -	17.32
Taylor's, - - -	17.39

These heights have been taken from the top of each dam to the point where it would be advisable to lock each separate canal into the river.

At Hocker's and Chambers's mills, the best site for the locks is in the bed of the river.

Doctor Fountain intends to remove his mill lower down, and to construct a wide mill race, to answer also the purpose of a canal. Next to the new position of his mill, there will be a good situation for locks.

At Sladen's mill, an old canal may be repaired, at the extremity of which there is a very eligible position for two locks.

At Taylor's mill, the best site for the necessary locks will be some distance below the mill.

Above Sladen's mill, another dam was building, which, if completed, will in all probability render the river boatable up to Fountain's mill.

At the time my examination took place, the river, which had been previously very low, on account of the long drought of the spring, was swelled by the rain, to what is considered its common height; and would generally have been navigable for boats drawing about 18 inches water, in all places free from obstructions.

But there can be no doubt that the parts which are navigable, are only so, because they are held up by the very bars of gravel or rock, which form the most material obstructions; and that it would be inexpedient to cut through them; as the mean velocity the water would then acquire, would probably be too great to preserve a sufficient water-way in those sections which are now deep enough, but from which, the water would be drawn off by the removal of the bars.

There being too little water in the river for a good sluice navigation, the system of improvement to be adopted, must be the same as on Willis's river, that is to say, low dams with falling gates. As Slate river is narrow, its bottom solid, its banks generally high and hard, and freshets do not appear to produce any considerable alluvions in any place, this kind of navigation will not be liable in it, to its ordinary disadvantages.

From the court-house to Hocker's mill pond, the river is very narrow; this section is so completely obstructed by fallen timber, that I could form no correct opinion of the quantity of water, and the nature of the bottom.

At present the bottom is muddy, but owing to the rapidity of the fall, I think it probable that when the drift shall have been removed, the mud will be carried away by the first freshet, and a hard foundation discovered. The water-way will certainly be found then to be very small; yet it is of importance for the surrounding country, that this part of the river should be rendered navigable at all times, in order that the principal produce, which is grain, may be boated down when ready for market. This advantage may be attained at little expense, owing to the narrowness of the river, by converting its bed into a canal by means of low dams and gates.

If the bottom, contrary to my ideas, should continue either muddy or sandy after the removal of the timber, these dams should be made by driving piles protected below by stones, and above by puddle. But this I expect, will not be found necessary, and they may then be made in the usual way of coffer dams, as in the other parts of the river.

Hocker's mill pond affords a good navigation for about two miles.

The first bar below this mill, is the *Black falls*; there the river runs for about 200 yards on a bed of rock. The whole fall is 4 feet; the width 120 feet.

Thence to Chambers's mill pond, three other shoals are found. They will require as many dams about 80 feet long.

From Chambers's to Fountain's mill, a distance of about 10 miles, the river is a succession of deep basins of almost standing water and abrupt falls, which indicate the position of 20 dams, averaging 90 feet in length.

Between Fountain's mill and Kidd's fall, 2 dams 80 feet long will be necessary. At Kidd's fall, the difference of level is 3.20 feet. It may be overcome by a single dam 150 feet in length. From thence to Sladen's mill 5 dams, about 90 feet long, will complete the navigation.

Below Sladen's mill, the removal of a few rocks and timber will open the passage for boats to the mouth of the river.

I am of opinion that, although cheaper when constructed above a fall, a dam is more advantageously situated below it. When it is placed at the top of the fall or ripple, a boat is rapidly carried down by a temporary current produced by the escape of the confined water; but it requires much labor to go up against it; only one boat can pass at a time, and the navigation is not without danger.

All these disadvantages are obviated by constructing the dam at the foot of the fall; the space between the dam and the bar becomes then a kind of lock in which many boats may be received, which rise or fall with the water contained in it, and always can pass the gate on a level.

As to the openings, the river being intended to be navigated only with boats not exceeding 7 feet in width, they need not be more than 8 feet wide. I would, in general, advise to place them near the hardest shore, and, to make the part of the dam adjoining the bank somewhat higher than the rest to some distance beyond the gate, in order that, in swells, boats might approach the gate without being exposed to be thrown over the dam.

Common sluice gates, to be raised vertically, are, I think, the most eligible kind for this system of navigation. Such a gate, balanced by a counterpoise on each side, could be raised with much ease by one man, and would return slowly to its place by its own weight; it would shut very tight, and the obstruction, caused by the sill of other gates, would be avoided. I would not hesitate to recommend them, if some measure could be taken to prevent the falling of the marginal timber into the bed of the river, which, in freshets, might carry away the vertical frame, requisite for raising these gates high enough for a boat to pass under.

It is very probable, however, that the difficulty of obtaining the destruction of all the timber which overhangs the river will necessitate the use of falling gates.

In times of freshets, the gates must be left open, in order to prevent an accumulation of sand in the channel above them.

As none of the dams need be higher than 4 feet, and good abutments will generally be found on the banks, they will not be very expensive, especially as stone, and very often timber, will be close at hand.

The following, is an estimate of the probable cost of the improvements:

To remove drift above Chambers's mill,	$800 00
For 13 dams, 50 feet long, 4 high, and their gates above Hocker's mill,	1,950 00
For 5 dams, 80 feet long,	850 00
For 25 dams, 90 feet long,	4,750 00
For 2 dams, 120 feet long,	470 00
For 1 dam, 150 feet long,	280 00
For removing rocks and drift, in various places,	500 00
	$ 9,600 00
For superintendence, &c., and for contingencies, 20 per cent.	1,920 00
Total amount,	$ 11,520 00

THE SOUTH BRANCH OF POTOWMAC.

This river shapes its course through a narrow, but fertile valley; its bottom is mostly a coarse gravel, that seems to have been brought into its bed by rapid torrents, which, after having deeply furrowed the adjacent hills, have caused the fall of the vegetable earth over the gravel, and left the hills a barren ridge. The causes of alimentary springs, having been mostly destroyed, by that progressive devastation, at the same time, that the steepness of the hills has been increased, it follows, that in any rainy seasons, the water is rapidly conveyed from the hills into the river in violent torrents, which produce sudden and local swells, whose irregularity occasions yearly changes in the constitution of the stream. A gravelly bottom, banks composed of a loose sediment, resting on a basis of gravel, are additional circumstances, which contribute to the instability of the stream; for, of all kinds of banks, the most easily undermined, are those resting on gravel: the want of adhesion of the stones, renders them easy to be removed, which effect produces the subsequent fall of the banks. Hence arises bars, islands and ripples, which at low water impede the navigation of the river. And as freshets are of short duration, it is only, for a very small number of days in the year, that the South Branch is susceptible of navigation.

This from the reports of the Potowmac commissioners, and the personal enquiries I have made, seems also to be the case with the North Branch. Both these streams appear, however, to be generally navigable at the same time. Hence the improvements on the South Branch must be made subservient to those of the main river, and any plan of improvement would be premature, before the contemplated works on the latter river have been carried into execution.

Such obstructions, as may be in the way in times of swells, are, I conceive, the only objects, which require an immediate attention: these are but few; some rocks in the trough, and in the vicinity of French's neck, are the only obstacles in the way at high water. I think, that $ 1,000 would remove them all.

In order, however, to furnish a basis, on which future speculations might rest, I thought, that it would be proper, to make a partial survey of the river. I therefore levelled from its mouth, up to the highest point, where improvements in the navigation would be of any benefit: This point is above a gap, two miles below Petersburg.

At the time of the survey, from October 24th, to November 15th, the water was at its lowest. The following table exhibits the principal results of the survey:

From	*To*	*Distance. Miles. Poles*	*Fall. Feet.*	*Fall per mile. Feet.*
Station 81, above the gap at the junction of many small branches of the river -	Station 1st, at the confluence of the south fork and main branch below Moorfield, - - - - - - - -	12.14	96.91	8.08
From station 1st, -	To the head of the trough, (station 37,) - - -	7.13	53.58	7.65
From station 37, -	Through the trough to station 56, opposite the poor-house, -	6.174	39.53	6.00
From station 56, -	To the head of the ripple below Staaten's (station 97, the fall of the ripple is 6.13 in 275 yards,) - - - -	6.160	38.10	5.86
From station 97, -	To the head of the pond backed up by the bar at the mouth of Mill creek, (station 103,) - - - -	1.79	9.47	7.57
From station 103, -	To the ripple at the mouth of Mill creek, station 112, -	1.79	0.26	0.20
From station 112, -	To station 123, about opposite Romney, - - - -	1.127	9.86	7.00
From station 123, -	To station 161, a little below the 1st hanging rock, - -	4.268	24.36	5.00
From station 161, -	To station 180, below the 2d hanging rock, - - -	4.47	15.97	3.85
From station 180, -	To station 201, above Parker's mill-dam, - - -	3.110	19.10	5.70
From station 201, -	To station 249, opposite McLaughlin's, - - -	9.250	36.41	3.70
From station 247, -	To station 264, in the concave of French's creek, - -	3.81	12.05	3.70
From station 264, -	Round French's creek to the mouth, - - -	4.292	19.21	3.90
	TOTAL, - - -	66 ms. 94 ps.	374 feet 81.	

The numbers of the stations in this table correspond to those of the field book.

The table shows that the fall from Petersburg to the Trough is greater than below. This circumstance is the cause of a greater width, and more numerous ripples and islands.

Below Moorfield, the South Branch receives the South Fork: but the river continues wide, and its banks low to some distance above the Trough; so that the addition of the waters of South Fork does not much increase the facility of navigating it for several miles.

From the Trough to the mouth, the fall diminishes gradually; navigable sheets of water become more numerous, and the river winds considerably more than above. But the nature of its banks remains generally the same; and it is worthy of remark, that almost every where, either the one or the other shore is rocky, while the opposite bank seems to be all alluvial. The bottom is, in general, gravel, except in some places where a slaty bed is discovered.

The heights of freshets, according to the information I have obtained, and the remarks I have been able to make, vary from 9 to 15 feet; they often overflow the alluvial margins to a considerable distance, and commit yearly depredations on them.

The progressive abrasion of the banks is not only a loss of property, but it contributes to render the river less and less navigable, by increasing its width, changing the direction of its current, producing a constant shifting of bars and ripples, &c. There is, on this subject, an opinion entertained by a great many persons, that what it takes away from one side it restores to the other. This is evidently an error. Light earth must be carried down with the stream; and, though partial alluvions may be left occasionally opposite to a place where the bank is worn by the stream, it cannot be doubted that the river increases progressively in width, at the expense of its banks, and will continue to do so, until it has attained such a width that freshets will no longer produce any injurious overthrow. The truth of this is attested by numerous sycamores, whose enormous growth is a plain evidence that, at no distant period, they were surrounded by vegetable earth, although some of them stand now more than 30 feet from the shore, while the other bank, as has been mentioned above, being solid rock, remains unchanged.

As to the various particulars of the bed and the banks of the South Branch, they are circumstances too minute to find a place in this report. They will be exhibited in the map which is to be prepared from the field book.

After having proceeded some distance in the examination of the South Branch, I became convinced that, like the North Branch, it would admit of no permanent improvements in its bed; and that a lateral canal was the only mode to procure a safe and constant navigation in that valley. This I will endeavor to demonstrate, by some observations on the formation of shoals and bars, which will, I hope, give a true measure of what can, in general, be expected from a sluice navigation.

The causes which induce the formation of bars, shoals, and islands, are of four distinct kinds:

1°. An increase of the rapidity of the current.
2°. An increase of width in the channel.
3°. A bend in the river.
4°. A tributary stream.

In the first place, it is obvious that a body of water, running down an inclined plane, would accelerate its velocity, if there was not a constant cause of retardation to counteract the incessant operation of the force of gravity. This cause is found in the friction against the bottom and shores of the channel:

That the same quantity of water will flow in the same time through different sections of a river, is a self-evident and leading principle, from which the following consequences may at once be deduced:

1°. That, the velocity remaining the same, of these two dimensions, the width and depth, one must increase when the other diminishes.

2°. That the transversal section of a river must increase when the velocity diminishes, and vice versa.

Farthermore—If a square trough be conceived to serve as a channel for a current of water, and if this trough be successively raised at one end, it is evident that there will be a degree of inclination which will cause the friction against the bottom and sides exactly to counterbalance the acceleration of gravity; under this angle the water will descend uniformly, and retain in the trough an invariable depth.

The same thing may be said of a river, when its fall is not such as would subvert its bottom.

If the trough receive a greater degree of inclination than that which produces an equilibrium between the accelerating force of gravity and the retarding friction on the sides and bottom, the water will accelerate, and the transversal section of the current consequently diminish as it progresses.

This is the effect in a river which flows on a rocky bottom. But in a river whose shores and bottom are such as will yield to the force of the current, the effect is different. Supposing, first, that the bottom alone is moveable, the velocity of the river will accelerate until the current shall have acquired a sufficient momentum to put in motion the stones at the bottom; these being lifted out of their place, a hollow will be formed. The opposite slope of this hollow, together with the weight of the rolling stones, will break the force of the current, and the stones raised out of their places will accumulate beyond the hollow, in continuation of its slope, and form a bar.

Over this bar the water will flow to re-commence the same operation, and produce, at a certain distance below, a similar effect, so that the bottom will become a succession of deep hollows and shoals; and no attempt to modify what is necessary to the equilibrium, or rather uniformity of the stream, can be attended with success.

The observation of rivers verifies this explanation, and both agree in furnishing the following facts:

A deep sheet of water is a sure indication of a proportionably rapid ripple; and the height of a bar and depth of a hollow increase with the power of the stream. Hence different freshets may change such bars.

The velocity and depth of rivers are very variable, and fords must be found after deep hollows, on the top of their counter-slopes. The steepness of slopes and swiftness of ripples increases with the coarseness of the gravel.

To overcome a ripple of this formation, it is evident that a canal cut through the bar would be an ill-advised plan, since the same cause must re-produce the same effect.

The raising of wing walls will answer a better purpose; and when the mutability of the current is not great, such low walls may require but few repairs. In general, however, a new freshet stirs up the gravel deposited by the preceding one, and ripples of this kind of formation are often remarked to be gradually removed higher up the stream.

The changes which occur in the bed of a river, are not confined to its bottom. The shores are often subject to abrasions, which occasions still greater obstructions. For, when by the acceleration of its velocity a river acquires such a power as to put gravel in motion, it acts upon its banks as well as on its bottom. Its width is thereby increased, the current is divided, and an island, or a long shoal formed.

The first idea which suggests itself in such a case, is to contract the channel; but, since the widening of the stream becomes a check on its velocity, a diminution of the width will restore the power of acceleration, and the effect removed from one place, will be re-produced at some distance lower down, or else the velocity would continue to be accelerated, which is inadmissible when the bottom or shores are not tenacious.

In the case of an island, one channel is often stopped up in order to improve the other. This plan which amounts to confining the channel, will seldom be attended with better success, and I think that the consequence must invariably be a bar at some distance below the island.

The third kind of ripples, which indeed is the most common, is formed by a bend in the river. A current impinging upon a bank, is not reflected by it, as many have advanced; for, reflection after impact supposes elasticity; and neither the water nor the bank is possessed of this property in a sufficient degree to produce any such effect. But the force of the stream is considerably diminished by the obstacle in its way, and therefore the water will rise to a greater height above the bend, in order to regenerate the lost momentum, and preserve the uniformity of the water-way. Hence an accumulation of gravel must take place above the bend where a ripple will be formed. The rapidity of this ripple will increase with the coarseness of the gravel, the acuteness of the angle of the bend, and also in a certain ratio to the velocity of the stream by which it is produced.

Sometimes the river undermines the foot of the bank: In that case, the ripple is not so considerable, and there is a deep sheet of water below it: whereas, when the ripple is formed by accumulation of gravel, the deep water is above.

In either case, there is an eddy formed on the concave side just above the angle, and another on the convex shore immediately below the elbow. The cause of these eddies is, that the water rushing rapidly down the slope, passes on; leaving on the right and left, as it were, two vacant spaces, towards which it returns, after the power which impelled it forward has been sufficiently checked by the opposite shore.

A sluice opened through a ripple formed by a short turn of the river, will in general fill up again, since the current will continue to be checked by the bank against which it impinges. If low walls be raised, they will contribute to lengthen the ripple, both above and below. By making, however, the walls curved, and extending the concave one farther than the other, it appears to me that a better end may be obtained.

In general, an obstruction in a stream will increase its subverting power, either on its bottom or banks; and, on the contrary, the destruction of a bar, by lessening the pond held up by it, takes away one of the causes of retardation of the stream, and the bar must either be formed again, or some equivalent effect be produced.

As to the bars formed by tributary streams, they generally extend obliquely across the river, and below the confluence. When they are not created by a rapid torrent, they have no other effect than to throw the channel on the other side. But, in the case of a very swift torrent, the bar is sometimes extended quite across the river; from which circumstance, results a deep pond above, and a brisk fall below the confluence: A cut made through the shoal, near the opposite bank, if it should not drain off the deep water above, may prove efficacious, provided that a dam be placed between it and the mouth of the creek. I think, however, that a more permanent improvement may be made by giving to the mouth of the tributary torrent a more oblique direction to the main current.

From all the foregoing remarks, it must appear evident, that the various obstructions, which are found in a river, depend as much on the shape and nature of its banks, as on the degree of firmness of its bottom, and that before engaging in a system of improvement, a careful examination must take place in different freshets, in order to ascertain the direction of the current for every swell, and the probable effect the vicissitudes of this important cause of obstructions may have on the works contemplated. The connection between the different parts of a river is such, that it is very difficult to modify any section of it, without producing a re-action of the river in some other place, if not at the same; and, therefore, of all systems of improvements, that which offers the least chance of success, is a sluice navigation. Its execution requires much more judgment, and critical examination, than is generally deemed necessary, and I should consider a minute plan of the river, both at high and low water, shewing all the circumstances of its course at different times, a most essential desideratum, before engaging in an undertaking of this nature.

The disadvantages and dangers of sluice navigation are plainly demonstrated, by the preceding exposition of the manner in which a river operates the changes which are every where observable in rapid streams. In some cases, however, sluices may be advisable. When the shores of a river are not easily abraded; when its bed, by the slow process of time, seems to have attained such a permanency, that freshets will cease to have any very sensible effect upon it, then a judicious disposition of sluices may procure advantages greater than the expenses of yearly repairs, and the work may be undertaken.

But, in the South Branch of the Potowmac, the great number of ripples, the mutability of the stream, the nature of the shores, and above all, the small quantity of water in many places, are circumstances which leave no doubt, as to the impracticability of improving it in this way.

The next mode of improvement, is that by dams and locks; but here it would be liable to the following objections:

1°. The foundation of dams, on a gravelly bottom, is either very expensive or unstable. The dams are apt to be undermined, or to settle in places; in which cases, the gates become unmanageable.

2°. They all require expensive aprons.

3°. They do not insure the stability of the bottom in times of freshets, and an accumulation of gravel may take place between two dams, during a high freshet, in a sufficient degree to obstruct entirely the intervening space.

4°. They will increase the yearly injury done to marginal property.

This last objection is one of a very serious nature, in a river which causes already so much havoc along its banks. Some persons contend, that the height of water in a freshet is not much increased by a dam: this is true, but the same thing cannot be said of the conclusion, that consequently it has but little effect on the banks.

Any object thrown into the river, has an effect on its current; a stone, for example, which projects above the level bottom of a river, opposes the current by lessening the transversal section. To overcome this obstacle, the section must increase the height, just above the stone, in order, that by a greater head of water, a greater velocity may be produced, and the same quantity of water may flow over the stone, as does in other places. The water which passes over the stone with an increased velocity, meets beyond it, a body of water less rapid than itself. This causes it to bubble up below the stone, and thereby to indicate its presence, and even in some measure, its size.

Although no such effect is observable, when the water is very high, it must not be inferred, that then the stone has less effect on the stream, than at low water. The reason why the effect is not observed at the surface, is, that the ratio of the stone to the depth of water, is much smaller in a swell. But it is well known, that the effect of a fluid on any obstacle in its way, is in proportion to the surface of the obstacle, and the square of the velocity of the fluid; and because the velocity of a river is much greater in a swell than at low water, and action and re-action are equal, it follows, that the resistance opposed by a stone, is also greater in a freshet.

Hence, it is an error to conceive, that because a low wall is at the bottom of a deep stream, it has less influence upon it than at low water. When a sheet of water flows over a dam, it falls with a much greater velocity, than if the bed of the river was on a level with the top of the dam. This increase elocity produces, of course, a diminution in the tranversal section of the stream on the dam; and calculations agree with experience to prove, that the height above the dam is indeed very small, with respect to the depth of the river itself at the same place. But, this I conceive to be the very reason why the banks are in great danger, For, since the same quantity of water must every where flow during the same time, a great diminution in the transversal section is an undeniable indication of a great acceleration of the same. But, the power of a current in displacing objects being, as mentioned above, in a duplicate ratio to its velocity, it follows, that the energy of a stream is greatly increased by the interposition of a dam.

The necessity of protecting at least one of the banks by strong abutments and wing walls, and also, the generally great width of the river in the vicinity of ripples, would raise the expense of each dam on the south branch to about $ 1000, which, because one of these must be constructed for about every two feet fall, would make the cost $ 500 for each foot lift, or about $ 185,000 for the whole; a by far too great expense for a kind of navigation every where very precarious and objectionable, but still more so in a river in which are found united all the obstacles to improvements in its bed.

As to the construction of a lateral canal, I so far examined the adjacent country as to be convinced of its practicability; but, I did not think that a complete survey would be at present a justifiable expense.

The gap below Petersburg affords a most excellent site for a dam, which might be raised to a height of 8 feet without interfering with the road; it would back up the water a little above the point where the survey began, and procure a very good basin for the boats of Petersburg and its vicinity.

From this first feeder, the canal would continue on the right shore to the trough, through which it would probably be advisable to use the bed of the river.

From the trough, the canal would be resumed on the right shore, and continue on the same side to some distance below the first hanging rock: some expense being incurred for occasional walling in that distance.

Below the first hanging rock, it would be necessary to cross the river; the canal would then continue down to the mouth, on the left shore.

If Mill creek could be used as a feeder, it would probably be found more advantageous to cross above Romney.

It is probable, that the length of [illegible] not be much less than that of the river itself [illegible] great distance would certainly be saved [illegible] anal across some of the principal bends, yet [illegible] racticable.

It was supposed, that at French's creek, about 3 miles might be saved by keeping the canal on a high level, in order to lead it through a low gap of the neck; but, an examination of the field notes will show that the elevation of station 258, which was taken at the foot of the gap, is upwards of 40 feet; and even this level could not be obtained on account of some perpendicular cliffs which would be in the way, the fall from the nearest of these to the neck being only 12.21 feet.

Although the expense of a canal cannot be correctly ascertained before its final location and a minute examination of its localities have taken place, it is certain that a canal would cost at least as much as the aggregate of the sums presented in the following rough estimate:

Between Petersburg and Moorfield.

Lockage of 97 feet, at $ 1,000,	$ 97,000 00	
Excavation of a canal, 3½ feet deep, 24 at top and 10 at bottom, 12 miles, at $ 1,400,	16,800 00	
	$ 113,800 00	
For culverts, dams, and all contingencies, add at least ⅓,	37,933 00	
		$ 151,733 00

From Moorfield to Romney.

Lockage of 151 feet,	$ 151,000 00	
Excavation of 24½ miles,	34,300 00	
	$ 185,300 00	
For contingencies, as above,	61,766 00	
		247,066 00

From Romney to the Mouth.

Lockage of 127 feet,	$ 127,000 00	
Excavation of 30 miles,	42,000 00	
	$ 169,000 00	
For contingencies,	56,333 00	
		225,333 00
Total amount,		$ 624,132 00

THE GREAT CAPE CAPEHON.

I examined this river, in July, from the Hardy line down to its mouth. The road between these two points is about 45 miles in length, but the river is not much short of 90. At about 22 land miles from its mouth it receives the North river, whose size is nearly equal to that of the Capon itself above the confluence.

At the time I viewed the Capon, I was told that in consequence of late rains, the water was somewhat higher than it usually is during the summer months, but, that it would not fall more than a few inches; an information I was inclined to credit, from the general appearance of the country, which probably affords more springs than the vicinity of the South Branch; and all the accounts I have received, agree that there is more water in the Capon than in the latter river.

Although the valley through which the present river flows, is neither so wide, nor so fertile as that of the South Branch, a great section of country is interested in its navigation. The produce, which consists chiefly of grain and flour, is now carried to the Winchester market; and it is calculated that the opening of the navigation would produce a difference of about 50 cents on the transportation of each barrel of flour to Harper's Ferry. In addition to this, a great quantity of very superior timber is now of little or no value, which would become an important article of trade, if the river was put in such a condition, that it could be rafted with safety down it, in common swells.

Some rafts indeed have, in time of freshets, descended the river from the fork; but, numerous wrecks attest the dangers of this only temporary navigation.

The Capon runs on a bottom mostly of rocks; it is not so wide as the South Branch of the Potowmac; its banks are more tenacious; its depth of water is greater. On all these accounts, its bed is more susceptible of improvements than that of the other river.

But, though the stream might become very valuable, if it received all the melioration it admits of, the present state of the country would not justify an expensive mode of improvement. To obtain such an opening for produce as will increase the value of property, and procure farther means of gradual improvements, is, I conceive, the present aim to which the attention of a company should be directed. It is under this point of view that I have made the examination.

The Capon contains, especially below the fork, a great number of navigable sheets of water, which are held up by those bars of gravel which are the cause of ripples, or by ledges of rocks, producing abrupt falls of the current.

To altogether remove such obstructions, would be, according to the observations made in regard to the South Branch, an ill-advised plan, and much judgment must be used, in order not to lose, rather than gain, in destroying an obstacle.

I think, that in this river sluices may be formed on ripples:

1°. Because the bed does not appear to be very changeable.

2°. Because only a partial navigation being intended, the water will be deep enough on most of the ripples in ordinary swells, and, consequently, there will remain but few of them.

3°. That the large stones, which obstruct the descent of boats on the ripples, are of a size which seems to indicate that they have rather been left than brought there; and that consequently, if taken out and used with brush for wing walls, a good object will be effected.

The principal obstructions in the river are rocks; some of them are found in loose masses, or occur in ledges, which rise up to the surface without producing any fall: these may of course be removed without producing any effect on the constitution of the stream.

Others project from the shore, and threaten destruction to rafts and boats. To blast away the most prominent and dangerous part of them, and to turn the current away from the other by extending a dry wall up stream, is one of the first operations to be attended to.

The destruction of a large jutting rock will tend to lower the ripple immediately above, which may be somewhat excavated, if it holds up a sufficiently deep pond or pool.

Lastly. Some abrupt falls occur in a few places. The most remarkable are above the fork, and have as yet prevented any attempt to descend the river. Two of them called White Falls, probably because the water foams over them, come in succession.

To cut an opening through these ledges would probably have the usual consequence of drawing off the water from a superior basin. And besides, considering that the velocity of the fall would increase with the depth of the sluice, it may be doubted whether the end would be attained of obtaining a depth of 2½ feet on a slope of 20 feet wide.

I am convinced that falling gates, or some substitute, will have to be resorted to. I have, therefore, estimated the expense accordingly, and would recommend to cut the opening in such a manner as to admit of the addition of a gate hereafter.

Boats may be made to ascend, though with some difficulty, as high up as the fork; above this point it would be utterly impracticable without dams and locks. But an ascending navigation does not appear to offer any advantage. Since, for the present, all that can be desired, is, to navigate the Capon when the Potowmac itself is boatable, the return being too precarious now to be an object of speculation; and, besides, considering all casualties, I question, very much, whether the return of a boat with half a load, for instance, would not cost more than the land transportation of the same.

I think that the following sums, judiciously laid out upon the designated sections, will secure the descent of rafts and boats in ordinary swells:

From the Hardy line, to the 1st mill, obstructions to remove, ripples to pass,	$ 100 00
For improving from the 1st to the 2d mill, (Lupton's,)	180 00
For improving to 3d mill,	80 00
For improving to White falls,	250 00
At White falls, (three falls and ripple,)	550 00
For improving to below the ford, at the fork,	120 00
From the fork, to Long rock,	120 00
At the Long rock and Big Fall,	130 00
From Big Fall to the 2d mill below the fork,	350 00
From the 2d mill to the mouth,	400 00
Total amount, - - -	$ 2,280 00

In addition to this, it must be observed, that from the fork to Big Fall, a distance of about 5 miles, 300 dollars had been already expended, which demonstrates, plainly, the possibility and advantages of the system of improvements contemplated.

There are above the fork 5 mill dams, and 3 below. Those above have no locks; the three last have very imperfect and even dangerous slopes.

On the North river, the following expenses will procure a navigation to correspond with that of the Capon:

From A. Paxton's mill to Pugh's dam,	$ 100 00
From Pugh's to Heiskell's mill,	150 00
From Heiskell's, to below the Long ripples and rocks,	160 00
From thence to the fork,	120 00
	$ 530 00
Making an aggregate for the two rivers,	$2,810 00

PATTERSON'S CREEK.

In a swell, boats can navigate this creek from Frankfort down to its mouth, with a load of 120 barrels of flour. It is said to be navigable from two to three months in the year. There is no obstruction worth noticing below the town.

Above it, some drifted timber, which could be removed for $ 200, and two mill dams, are the only things to oppose the navigation when the river is high.

The bed of the creek being generally gravel, and the quantity of water in it usually very small, I do not think that any attempt to render it navigable at other times than full tides, would be attended with success.

CLAUDIUS CROZET'S

REPORTS

ON THE

Road between Staunton and the Little Kanawha, and the road between Romney and Winchester.

THE ROAD FROM STAUNTON, TO THE MOUTH OF THE LITTLE KANAWHA.

For the purpose of ascertaining the course of the straight line, which connects the two extreme points of the intended road; and also in order to form a map, by means of which the respective situations of the different places to be examined, might be embraced at one view; I survey the shortest road between Staunton and Parkersburg. The survey was made partly by triangulation, from mountain to mountain, with a large theodolite, partly with the chain and compass, when the nature of the country forced me to resort to this inaccurate method.

In the calculations and platting of the survey, two kinds of corrections have been introduced, which I deem necessary in a survey of such an extent. The first correction, is relative to the difference of variation of the compass in different places. I found by solar observations, taken with a small theodolite, that the variation from Staunton to Tygart's valley, is 1 deg. 37 min. east from the latter place; it kept increasing, as I proceeded westward: it was, on the 26th of September, 2 deg. 8 min. east, at Haymond's salt works, and on the 20th of same month, 3 deg. 35 min. at Parkersburg.

The other correction relates to the curvature of the earth. Knowing, that the course from Staunton to Parkersburg, did not differ much from N. 60 W., I took this course, as the basis of the platting, and having calculated the spherical triangle, formed by this course, and the meridians of Staunton and Parkersburg, I found that a straight line drawn from Staunton, in the course N. 60 W. would increase in its bearing about 3 min. for every 5 miles, and would bear N. 61 deg. 33 min. W. at or near Parkersburg, so that on this account, together with the variation of the compass, there would be found in the course at Parkersburg, a difference of 5 deg. 8 min. from that, which would result from the platting, without attending to the above mentioned corrections.

My field books contain all these calculations.

Numerous stakes, and marks have been left along the line, in order that the operations might be easily resumed, and corrected both on the ground and map, with the fundamental survey at any place and time. All such marks are carefully recorded and designated in my field books.

The length of the straight line, between the two extreme points, was found by trigonometric computation to be 156 miles. The actual distance surveyed by the road, is 215 miles.

The line crosses the road or path, 1° on the top of the Shenandoah or Calf Pasture mountain, 2° on the top of the Alleghany mountain, 3° at the foot of the second Alleghany or Greenbrier mountain. From this last place, the path is very devious; it declines considerably to the north, to some distance beyond Tygart's valley; it then takes a south-westerly direction, and crosses the line again in the woods of Lewis county, near the plantation of capt. Gould's, after which it deviates greatly from the straight course, by passing through Haymond's salt works. From this latter place, it follows the meanders of the Little Kanawha to Leading creek, and then crosses the dividing ridge, between this and Hughes's river, where it comes back again to the line, near to which it is generally found, from that point to Parkersburg.

The general direction of the line possesses the very material advantage; that it heads the principal waters of the country, and that the road will open a communication between the vallies of the tributary streams of James river and Potowmac, without crossing any considerable river.

The line crosses nearly at right angles a number of parallel ridges, which are all very steep, as far as the Alleghany mountain. This and the following mountains are generally less steep, and more broad at top.

The ridges, in the order they are found, are,

1°. The Big or North mountain, which is intersected by the line between Jennings' and Buffalo gap.

2°. The Shenandoah or Calf pasture mountain. Through this mountain there is no gap. The two lower places, in the vicinity of the line, are that where the present road passes, and Hodge's draft, 3 miles to the south of it.

3°. Shaw's ridge. The map shews that about half a mile is lost in ascending it.

4°. The Bull Pasture mountain. Over this ridge the road is badly located on the Staunton side: 2 miles south of the road, there is a very good gap, commonly called Stewart's gap.

5°. Jackson's mountain, a very steep and rocky ridge. It is now crossed along the Crab run: it may also be traversed, but with more difficulty, about one mile more to the south, along Stewart's run.

6°. Straight Creek mountain, which is steep but not rocky. It may be entirely avoided by passing Jackson's mountain, at Stewart's run.

7°. Back Creek mountain. This cannot be crossed, otherwise than by graduating the road on its declivity.

8°. Middle mountain.

9°. The Alleghany. The point where the road and line meet on this last mountain, is the best place where it can be crossed over. The ascent on the Staunton side is very gradual; on the other side, the path descends on a spur, and requires only widening to make a good waggon road. The only objection to this direction is, that it runs rather too much north. But, it is a general and unfavorable circumstance, that all the spurs and gaps take a very oblique direction to the ridges.

After having crossed Greenbrier valley, the next mountains found, are the second Alleghany or Greenbrier mountain, and Cheat mountain. A road, 30 feet wide, has been made from Tygart's valley to the Pocahontas line, and a company was engaged, in the month of October, in extending it down to Greenbrier.

On the other side of Tygart's valley, two high ridges are encountered. The first is Rich mountain; the other, the dividing ridge between the waters of Middle Fork and Buchanan river. Thence, to the Ohio, the country is much broken, but the mountains are neither so high, nor so rocky as before; and the ground appears to be generally favorable to the location of a good road.

After having completed the principal survey, and obtained a general knowledge of the country which is to be traversed by the road, I employed the rest of the time in local examinations, and partial surveys. From these operations, I have obtained a sufficient knowledge of the localities to lay off road as far as the Alleghany, and would have undertal this year, had the examination of the Potowmac admitted of any longer delay.

I found that, from Staunton to the fixed point on the top of the Alleghany mountain, two different routes may be taken.

One of them will retain many sections of the existing road; and, in that respect, prove less expensive. The other will be entirely new, but certainly the better road, and ought to receive the preference for a turnpike 30 feet wide; in which case, the preserving of part of the present road would cease to be an object.

This last route crosses the North mountain through Buffalo gap; opposite to which, in the Shenandoah mountain, is found Hodge's draft. Through this, a much better road than the present one could be made. This direction would entirely avoid Shaw's ridge, and lead to Stewart's gap in the Bull Pasture mountain. There is already a road in this gap, which, with some additional labor, could be made a perfect turnpike. Opposite this gap, in Jackson's mountain, there is an opening along Stewart's run, the entrance of which would cost much labor, for 2 or 300 yards; but, the overcoming of this difficulty would procure a much shorter direction than the Crab run, whose length is entirely a lost distance, and would, besides, as I have already mentioned, avoid altogether Straight Creek mountain.

It might be objected, that this route is from 3 to 4 miles from the line: but, I am convinced that it will, notwithstanding, be found to be the shorter of the two: for, the other road deviates a great deal from the straight course through Jennings' gap; about half a mile is lost ascending Shaw's ridge; as much must be lost in graduating the ascent on the Bull Pasture, and through the Crab run; a distance of 9 miles is travelled between two points which are only 5 miles apart. If, to these windings, there be added the necessity of ascending and descending Straight Creek mountain, which is both steep and narrow, it cannot be doubted that, as far as Back Creek mountain, the existing road is longer than the other. But, both must pass over this last mountain, before reaching the Alleghany; and the distance lost by the old road, in effecting it, will serve to bring the new one back to the general line. I would, therefore, not hesitate to recommend the latter route, if a turnpike was intended; but, as the expense of opening a common narrow road there would be much greater than the improving of that which is now travelled, it appeared to me that present circumstances would make it advisable to adopt the last plan, and I consequently examined it with the view of making of it a good communication from 12 to 18 feet wide. Over this dimension, obstacles would be found in it, which, by making it as expensive, must determine the selection of the other route. Under the conviction then, that a common road will sufficiently satisfy the present wants of that section of the country, I submit the following conclusions:

1°. From Staunton, to and through Jennings' gap, the road is travelled to the Warm Springs; and, although susceptible of improvement, may be used in its present state.

2°. Across the Shenandoah mountain, some changes in the graduation, near the top of the dividing ridge, may be made to lengthen the slope, and thereby diminish the danger of this part of the road. In consequence of these modifications, the road would cross the dividing ridge, about 300 yards north of the present place: This, and all other changes, will be designated on the map. On the subject of the luckless location of this road, I beg leave to offer a few remarks. In general, in making a road across a mountain, it is very common to penetrate to a considerable distance, between two spurs along a run, and then to rise, by graduating from the head of this run to the top of the mountain. This is usually done, on account of the facility of approaching to the foot of the mountain almost on a level; and, also, because where a stream takes its rise, the dividing ridge is lower. But, on the other hand, it generally happens, that spurs are in the prolongation of spurs, and brooks head on opposite sides, so that the dividing ridge is almost always narrow, steep and rocky. In addition to which, as the bases of spurs become broader, as they increase in height, it follows that the space between them is much contracted, where they join the main mountain; and that, not unfrequently, there is hardly room left for graduating on either side of the dividing ridge. A road, under such circumstances, is necessarily muddy, rocky and icy, at the foot of the hill, and both steep and very winding on the declivity of the very narrow partition between the two slopes. That a mountain must be crossed at a low place, is self-evident; but that it is only one of the many requisites, for making a good mountain road, is also a plain fact. The most eligible ratio, between the base and height of a slope of considerable length, being that of 14 to 1, or about one mile for every 125 yards rise, the different low places in the vicinity of the given direction must be examined, and the distance corresponding to each elevation determined. That point then, towards which the graduation deviates less from the intended course, must receive the preference, even if a little higher; provided, of course, that the ground do not present obstacles to counterbalance the advantage gained in point of direction. If, with the other advantages, that of a southern exposure can be combined, the road will be properly located in such a place, after having fixed upon the point where a mountain must be crossed, the distance, which corresponds to the height to be obtained, must be measured along the foot of the mountain or spur, and then the graduation may be made with complete regularity. If an examination of the Shenandoah mountain had been made in this manner, there cannot be the least doubt that the road would have been taken through Hodge's draft, which unites the advantages of a sunny exposure, a solid and dry ground, and an easy ascent and descent, along the opposite spurs, which form the northern limit of the draft. It is also probable that an easier ascent than 1 to 14, might be obtained.

3°. Next to the Shenandoah mountain comes Shaw's ridge, the ascent of which must be made more gradual, by beginning it at a distance from the top, equal to fourteen times its height.

4°. The Bull Pasture mountain is another instance of the inconveniences and dangers resulting from the location of a road near a run. Instead of taking to the south, as it now does, the road must incline to the right, and be made to rise on the declivity of the mountain, very near the point where it reaches its base. Although this mountain is generally very rocky, if the road is not made wide, it is probable, that where I recommend it, the excavation on the declivity will reach no rock of any size. This new direction will give a southern exposure to the slope of the road, which will cross the top of the mountain on a broad level, and then descend on the south side of a spur to meet the old road again near Armstrong's; from which place it must continue along a run in its present direction. The proposed alteration will shorten the road by about a mile.

The mountain is so broken and rocky, that, after a careful examination of every outlet, I am convinced that no other direction than this, or Stewart's gap, can be taken through it.

5°. The present road crosses Jackson's mountain, on a low level along the Crab run; and, although this place is both very rocky and icy, and 4 miles are lost by taking this direction, the whole mountain is too high and steep to allow of any other course. In the expectation that some distance might be gained by crossing the mountain, at a low place very near the line, I measured the height of it, and found that it would be necessary to graduate an elevation of 850 feet. To overcome this, a distance of 2¼ miles would be nearly lost on each side; so that, besides the difficulty of the ascent, the distance would be greater still than by the Crab run. The map will show the result of my survey and examination in this quarter.

After the Crab run, the waggon road ceases. Straight and Back creek mountains must be crossed about a mile to the south of the present path. They are both very steep and narrow at top, but the ground will generally be found free from rocks.

7°. Middle mountain, and the Alleghany, present no difficulty. Both these mountains are broad, and the ground generally firm, except for a short distance in the bottom between them.

The ground continues good to the foot of the second Alleghany. The distance from this point to Tygart's valley is 14 miles. As I have already stated, a wide road has been undertaken over this space. Owing to a great number of springs, this road, for about five miles in the vicinity of Cheat river, is excessively miry, and altogether impracticable for waggons. This part is intended to be paved. It appeared to me that, if it was raised, and a deep ditch cut between it and the declivity of the hill, the springs would not ooze any longer through the road: the water supplied by them would collect in the ditch, and might be carried off by occasional culverts under the road. At any rate, there can be no doubt of this fact, that the most of the paving would be saved in this way, and a much better road formed; for, paving on a soft foundation can hardly be called an improvement. It seemed to me, besides, that, by attending too much to the straightness of the road, it had been made to cross several low places, which might have been avoided, by keeping it on a higher level. A straight road, like a straight canal, will often prove more expensive than a curved one, suited to the ground; and, in a case like this, ought certainly not to be preferred.

I have offered these remarks, on the road between Greenbrier and Tygart's valley, because I think that, although it inclines to the north, it ought to make part of the general road. The expense of cutting a new road, through such a ridge, could not be compensated by the small distance saved, if even such an advantage was obtained; which may be doubted, for this reason; that, as I have observed in another place, the gaps and spurs assume generally a north-westerly direction; and the point where the road begins, in Greenbrier, being in the general line, there is every probability that no better direction could be found. The expense, and waste of time, in exploring and surveying through these unknown woods, where the sun hardly ever penetrates, and the whole ground is covered with rocks, and fallen timber, overspread with a thick moss, which completely disguises the soil; such an expense, I say, would even be greater than the end obtained, if indeed it did result in any thing like success.
avoid the miry shores of Cheat river, would indeed be a

inducement to change the present road; but, according to all the accounts, no material difference could be found in any place.

The loss of distance may, however, be somewhat diminished by descending into Tygart's valley along the side of a spur which puts in from the top of the mountain, about 4 miles from the valley, in a direction more in course than the road.

From the valley to the Ohio, the country is totally unexplored: but, judging from the water-courses, and what information I could get, the direction of the line traverses it in probably the most advantageous places.

There can be no doubt of the great benefit, a road leading to the metropolis would be to this part of the country; but, I think a width of 30 feet would render it more expensive than present circumstances seem to advise. The expense of a road being nearly proportional to the square of its width, I think that this road ought not to be made wider than 12 feet: with this width, eight or nine miles of it would not cost more than one mile of a road 30 feet wide.

It may be objected, that the width I propose, is not sufficient for two waggons; but a few wide places at the top of each ascent, and in other commanding situations, will obviate this difficulty. It is, besides, a well known fact, that many much travelled roads, among the mountains, have not a greater width. When the road shall be so much travelled as to cause this inconvenience to be felt, then it may be widened, by laying out upon it the additional expense that would be incurred now.

As to the section of the road from the valley to Staunton, I think that it ought to be made 18 feet wide, exclusive of ditches. With that width, it would cost only one-third of a common road.

On this subject, it may be proper to remark, that in a road, cut out of the declivity of a hill, a ditch is a great addition to the expense of excavation; but, in many cases, it may be made without expense above the road on the slope of the hill. There it will stop, and carry away the water, which in heavy rains would otherwise cut deep furrows across the road: by this means, only the rain which falls on the road, will flow on it. In every case, I think it advantageous to incline the transversal slope of a mountain road towards the hill: from this disposition, there results a better preservation of the road, and a greater security for waggons, particularly in windings: The water rushing down the hill does not then cross the road, but flows along the acclivity of the mountain. If this requires a little more labor, it is more than compensated by the greater durability of the work.

THE ROADS FROM WINCHESTER TO ROMNEY, AND TO FRANKFORT.

Considering that on the Staunton road, the necessary calculations of upwards of 3400 courses, and the platting of the same, which must be made previous to any farther operations, had taken me a considerable time, which might otherwise have been employed in the field; I thought, that while I was in the vicinity of Romney, it would be proper to take a survey of the existing road between that town, and the towns of Winchester and Frankfort, in order that the calculations and preparatory platting being made during the winter, they might occasion no delay on the field; these I have not had time to complete.

In regard to this road, I have to observe, that there are now three different roads, between the two towns of Remney and Winchester, and that it would be expedient to concentrate the yearly expense of repairing them, on one and a better road. The intervening ridges are generally slaty, and the ground is consequently good, but does not admit of a great slope, on account of its being easily washed away when crushed by waggons. This is the only difficulty worth noticing, which will be encountered between Romney and Winchester.

The addition of the survey from Romney to Frankfort, will serve to determine the course from Winchester to Frankfort, without going over the whole distance between these two places. The variation of the compass was, on the 26th of October, only 15 min. east at Romney.

DOCUMENTS.

LITTLE RIVER TURNPIKE COMPANY.

ALEXANDRIA, 12th mo. 1st, 1823.

J. BROWN, Jr. Secretary to the
Board of Public Works, Richmond.

Herewith, thou wilt receive the report of the president and directors of the Little River turnpike company, made to the stockholders, at their annual meeting held in Alexandria, the 10th of January last, which is now handed thee for the information of the Board of Public Works of Virginia.

The report was read, and approved; and, agreeably to the recommendation therein contained, a dividend of four per cent. was declared, payable on the first day of February, which has been paid as fast as called for. It may not be amiss further to state, the balance reported due the State of Virginia of $ 5,076 32 cents, has since been paid, say on the 11th of March, to the draft of Jerman Baker, esq. treasurer of the State of Virginia.

Respectfully, thy friend,

PHINEAS JANNEY,
President of the Little River turnpike company.

The president and directors of the Little River turnpike road company, respectfully report to the stockholders:

That the receipts for tolls for the year ending the 31st December, 1822, amount to	$ 16,437	75
And for fractional parts of shares in paying stock dividends,	18	33
Balance in the hands of the treasurer, on settlement of his account for the year 1821,	6,739	33
Amount carried forward,	$ 23,195	41

Amount brought forward,		$ 23,195 41
There has been expended, in repairs by James Lewis, superintendent of the upper district, on 17½ miles of road, including his salary of $ 400,	$ 2,460 26	
And by Thomas Moss, superintendent of the lower district of 16 3-8 miles, including the building of 2 good stone bridges, one between the 5th and 6th mile stones, and the other between the 9th and 10th mile stones; also cutting down a hill between the 9th and 10th mile stones, and including his salary of $ 400,	3,083 74	
Payment of the salaries of all the gate-keepers, including a balance of $ 18 76, due from last year to J. Ballinger,	1,568 76	
Salary of the president $ 200; four directors, each, $ 100; expenses do. on road, $ 6 50,	606 50	
The treasurer's commission on $ 16,456 08, at 2 per cent.	329 12	
Compensation allowed him for expense of collecting from gate-keepers, &c. as fixed by stockholders, in general meeting last year,	40 00	
Marshals' and clerks' fees, and printers' bills,	32 83	
Expense of stockholders, commissioners, and directors at general meeting,	48 82	
Counterfeit notes received by gate-keepers, remaining in treasurer's hands,	7 00	
Paid Robert Radcliffe, on account of bridge over Cub run, commenced last year and now completed,	150 00	
Paid for 1½ shares of stock, at $ 92, and ¾ of a share at $ 95, purchased,	209 25	
Amount carried forward,	$ 8,536 28	$ 23,195 41

Amount brought forward,	$ 8,536 28	$23,195 41
Repairing bridge over Little river; paid our proportion, as per agreement with Ashby's Gap turnpike road company,	34 77	
Repairing toll-house at gate No. 1,	8 13	
Paid dividend for 1821, and balance of 1819 and 1820, per treasurer's account,	9,420 42	
		17,999 60
Leaving a balance in the hands of the treasurer, as per his account, of		$ 5,195 81
There are, also, debts and property belonging to the company, as per schedule made out by the treasurer, amounting to $ 1,516 73; $ 739 67 of which is considered good, and $ 626 06 doubtful,		739 67
		$ 5,935 48
The company owes a balance on cash dividends, uncalled for,	$ 736 55	
And on dividends, declared payable in stock in 1810 and 1815,	469 35	
There is, also, a balance due the State of Virginia, growing out of the collection of militia fines, as per report of last year, which is subject to the draft of the treasurer of the said state,	5,076 32	
		6,282 22

The President and Directors further report:

That they found it necessary to erect two bridges, since the last annual report, in the places previously occupied by wooden bridges, which had become so much decayed, as to be unsafe to attempt crossing on. The first one erected early in the summer, is between the 5th and 6th mile-stones, and the other between the 9th and 10th mile-stones. They are substantial good bridges, built with stone, the work faithfully done and completed, as far as respects the bridges; but the pavement over the bridge, between the 9th and 10th mile-stones is not yet completed, in consequence of the quantity of loose earth, taken to raise the low ground on each side not having become sufficiently settled to pave on, previous to the bad weather setting in. Measures are now taken to keep that part of the road in good order, till the pavement can be done. They further report as their opinion, that it will be necessary, to build a new bridge across Accotinct in the course of the present year, which they would recommend being built of stone, there being great plenty of excellent stone near the spot.

In consequence of the very light crops of grain in the upper country, the quantity of produce brought to our market this season has been unusually small, which has lessened our receipt of tolls nearly four thousand dollars, when at the same time, we have only been enabled to lessen our expenditures a little more than one-third of that amount, unless we suffered the road to go without necessary repairs, which the substantial interests of the stockholders and the community at large forbid.

Under present circumstances, the president and directors feel it their duty to recommend to the stockholders, to only declare a dividend of four per cent., for the last year, payable on the first day of February next.

Which is respectfully submitted.

PHINEAS JANNEY, *President*,
G. CARTER,
REUBEN JOHNSTON,
CHARLES LEWIS,
ABIJAH JANNEY, } *Directors.*

Alexandria, 10*th January*, 1823.

DISMAL SWAMP CANAL COMPANY.

Return of the state of the Dismal Swamp Canal Company, on the 30th November, 1823.

Capital stock subscribed and paid by stockholders,		$ 160,000 00
Amount due by Board of Public Works, nothing,		00 00
Capital expended in the works, viz:		
Amount of 'general expenditures' account,	$ 340,369 53	
Amount of Stone Lock,	65,434 88	
Amount of Discount,	14,939 19	
Amount of contingent expenses,	190 45	
Amount of interest,	4,550	
Amount of W. McPherson, contractor,	4,550 00	
Amount of R. Hall, contractor,	1,200 00	
		429,757 85
Tolls received up to 1st December, 1822,	100,423 33	
Tolls received from that time to this,	7,429 98	
		107,853 31
Officers' Salaries, &c.		
M. Parks, superintendent and engineer,	$ 1,200 a year,	
Garrett, overseer of workmen,	360 do.	
Carr, toll-keeper,	360 do.	
And two lock keepers,	144 do. each,	
Alexander Ferret, accountant,	00	
Dividends declared, and when? none at any time.		
Balance of money in hand, due by M. Parks,		832 58
Debts due by the company, viz:		
To the Board of Pubic Works,	$ 50,000 00	
(By accommodations) to the banks, of which $ 50,000 on pledge of stock,	108,500 00	
To sundry individuals, &c.	12,137 87	
		170,637 87

Debts due to the company, otherwise than on account of stock.
By sundries, *$4,689 35.—† $ 3,211 40

(*Signed*)

JOHN COWPER,
GEORGE McINTOSH,
JOHN TABB,
JOHN TUNIS.

Norfolk, November 30*th*, 1823.

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[*] This sum is charged to the commissioners who superintended the lotteries, and is the amount of the loss of the company thereon.

[†] This sum the company had to pay for real estate damages, sustained by individuals in cutting the canal.

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UPPER APPOMATTOX CANAL COMPANY.

Return of the state of the Appomattox company, on the 1st day of September, 1823.

Capital subscribed,	$61,100 00
Aggregate of requisitions made on stockholders,	61,100 00
Amount paid by stockholders,	60,800 00
Amount due by the Board of Public Works,	00 00
Amount due by individual stockholders,	300 00
Capital expended in the work,	86,789 61
Tolls received from the 1st September, 1822, to 1st September, 1823, (see paper marked B,)	2,163 92
Lease of water, due for same period,	2,000 00
Sum expended in improvements and repairs,	00 00
Officers' salaries, and expenses of collecting tolls,	500 00
All other expenses, and for what?	00 00
Dividends declared,	00 00
Balance of money on hand,	458 85
Debts due by the company, exclusive of interest,	9,913 53
Debts due to the company, including interest,	15,082 51

The interest due by the company has been overlooked by the clerk, and cannot, at this time, be supplied by us.

RICHARD N. VENABLE,
THOMAS A. MORTON.

POTOWMAC COMPANY.

OFFICE OF THE POTOWMAC COMPANY,
GEORGETOWN, 4th December, 1823.

SIR,

In compliance with your letter of the 1st of October last, addressed to the president and directors of the Potowmac company, requesting, in behalf of the Board of Public Works of Virginia, certain information relative to the affairs of the Potowmac company, I have now the pleasure to transmit a table from the treasurer and clerk of the company, containing that information, and in the form prescribed.

Very respectfully, I am, sir,
Your most obedient servant,
J. MASON,
President of the Potowmac company.

J. BROWN, Jr. *Secretary to the Board of Public Works.*

Return of the state of the Potowmac company, on the 1st day of August, 1823.

Capital subscribed,	$ 355,111 11
Aggregate of requisitions made on stockholders,	355,111 11
Amount due by individual stockholders,	932 20
Amount due by the Board of Public Works,	00 00
Capital expended in the work,*	336,551 10
* *Note*—The whole sum expended on the work, including the capital, the toll money, and the funds arising from loans, amount to	734,972 30

Amount of tolls received from 1st of August, 1822, to 1st August, 1823,	6,238 85
Sums expended out of the tolls, in repairs and improvements, officers' salaries, and other expenses,	222,418 61
Officers' salaries, and expenses of collecting tolls per annum,	2,100 00
Dividend declared 2d August, 1802, (Note—this is the only dividend ever made to the stockholders,)	3,890 00
Amount of cash on hand,	1,857 91
Amount of debts due by the company,	184,122 95
Amount of debts due to the company, otherwise than on account of stock,	15,126 00

JAMES MOORE, Jr.
Treasurer Potowmac Company.

SWIFT-RUN-GAP TURNPIKE COMPANY.

OFFICE OF THE SWIFT-RUN-GAP TURNPIKE,
Fredericksburg, 4*th December*, 1823.

Sir,

Enclosed you will receive the return of the Swift-Run-Gap Turnpike Company, for the year ending this day.

Very respectfully,
WILLIAM ALLEN,
Secretary and Treasurer.

J. Brown, Jr. *Secretary to the Board of Public Works.*

Return of the state of the Swift-Run-Gap Turnpike Company, December 4, 1823.

Capital subscribed, by individuals,	$ 69,700 00	
Capital subscribed, by Commonwealth of Virginia,	4,100 00	
Capital subscribed, by Board of Public Works.	46,000 00	
		$ 119,800 00

Aggregate of requisitions made on stockholders,		$ 69,700 00
Amount paid by stockholders,		68,453 00
Amount due by Board of Public Works,		00 00
Amount due by individual stockholders,		1,247 00
Capital expended on the work,		123,727 00
Tolls received from 1st December, 1822, to 1st December, 1823,		3,238 00
Sums expended out of the tolls in improvements and repairs,		6,524 00
Officers' salaries:		
Secretary and treasurer, per annum,	$ 133 34	
1 gate keeper, per annum,	200 00	
1 do. do.	150 00	
2 do. do. each,	100 00	
1 overseer, do.	325 00	
		908 34
All other expenses,		00 00
Dividends declared since last return,		00 00
Balance of money on hand,		675 07
Debts due by the company:		
Sundry persons for the surplus of their stock, which was sold for the instalments due thereon,	$ 186 00	
Road-maker for balance of contract,	25 00	
For negro hire, for the present year,	349 00	
Virginia Bank for money borrowed,	2,750 00	
		3,310 00
Debts due by the company other than from stockholders:		
Advanced discounts for a company, which subscribed $ 10,000 worth of stock, and borrowed the money from bank,		1,427 56

ROANOKE NAVIGATION COMPANY.

To the Stockholders of the Roanoke Navigation Company.

GENTLEMEN,

We at length have the satisfaction of reporting to you the completion of the important work which has been so long the object of our care, (the Roanoke canal.) The great advantage of this work, in connexion with those now progressing on the Roanoke, must shortly develope themselves; and, to all those residing on its waters, your zeal and perseverance, throughout the whole arduous undertaking, must be a source of grateful recollection, while the liberality you have evinced in vesting large sums of money in what has perhaps been justly considered, by many, a scheme affording no prospect of speedy remuneration, must excite the admiration of all. Those who, regardless of every inconvenience, adventure their labor and their means in undertakings, which are only calculated with certainty, to result in public advantage, are public benefactors, and, sooner or later, will receive the reward of public approbation. Upon this ground, gentlemen, you rest secure. Through a period of uncommon depression, you have answered the drafts made upon you, for carrying on these works, with an alacrity unexampled in similar institutions; and, regardless of local clamor, and sectional interests, you have kept your eye steadily fixed on the great object whose completion we have the happiness now to congratulate you on. Encouraged by these instances of your devotion to the institution, we entertain no doubt that the principles which have led you so far, will still animate you to new exertions, and will finally enable you to see the termination of the whole system of works originally contemplated for this river. Nor do we consider this period very remote. The next year will most certainly bring us to the junction of the Dan and Staunton; from which point, the navigation is good for many miles. We are satisfied that, at the close of the next year, the Roanoke will present a safe and easy navigation to the extent of one hundred and ten miles above this place, through a most fertile and delightful country; when will flow in the channels you have opened for them, the rich products of this extensive region.

We beg to refer you, gentlemen, to the report of the superintendents for a detail of the operations of the present year. By it, you will perceive that since completing the canal, the obstructions at Eaton's falls have been nearly overcome by means of a canal and lock; the one of which has been finished, and the other will be ready for use in a few weeks. We submit for your inspection, also, a letter from Mr. David Clark, who kindly undertook the management of sundry improvements in the river below this place, which will shew you what has been done in relation thereto.

For information respecting the monied transactions of the company during the present year, we refer you to the report of the treasurer, and to an examination of our accounts and vouchers; all of which are laid before you.

CAD. JONES, *President.*
WM. E. BRODNAX,
RICH'D APPERSON,
JOHN R. EATON,
SAMUEL PANNILL, *Directors.*
DAVID CLARK,
JAMES BRUCE,

Weldon, N. C. 10*th Nov.* 1823.

A true copy from the original, sent to the Board of Public Works of Virginia, by order of the board of directors of the Roanoke navigation company.

A. JOYNER, *Clerk.*

To the President and directors of the
Roanoke Navigation Company.

The undersigned, treasurer of the Roanoke navigation company, respectfully reports, that at the last general meeting, there remained in the treasury a balance of	$9,788 08
And that, since that period, there has been received from stockholders, on account of various instalments, the sum of	27,001 54
From Robert Johnston, late treasurer, principal and interest,	1,366 40
From Robert B. Daniel, for negroes Ned and Moses sold him, principal and interest,	1,005 50
From Nelson Hamel, for hire of negro Celia,	11 00
From William Hogan, for balance due for negroes Ellis and Dempsey sold him, principal and interest,	805 00
	$ 39,977 52

Brought forward,	$ 39,977	52
And that during the same period, disbursements have been made on account of canal expenses and improvements on the river, amounting to	28,788	73
Leaving a balance remaining in the treasury, of	$ 11,188	79
To which may be added the nett amount of toll collected on produce carried through the canal,	69	58
Total amount in the treasury,	$ 11,258	37

Weldon, 10*th Nov.* 1823.

A. JOYNER, *Treasurer.*

A true copy from the original, sent to the Board of Public Works of Virginia, by order of the president and directors of the Roanoke navigation company.

A. JOYNER, *Clerk.*

* * *

Return of the state of the Roanoke Navigation Company, on the 10th day of November, 1823.

Capital subscribed,	$ 387,000	00
Aggregate amount of requisitions made on stockholders,	321,210	00
	(or 83 per cent.)	
Amount paid by stockholders,	293,877	00
Amount due by individual stockholders,	27,333.	00
Amount due by insolvent stockholders, formerly part of the amount due by individual stockholders,	7,377	00
Amount due by the Board of Public Works of Virginia,	00	00
Amount due by the board of Internal Improvement of North Carolina,	00	00
Capital expended in the work to the 10th November, 1823,	287,976	78
Tolls received from the 1st August, 1823, to the 1st of November, 1823, Nett,	69	58

Sums expended out of the tolls, in repairs and improvements,	00	00
Officers' salaries, and expenses of collecting tolls, *in detail:*		
Toll collector,	29	90
All other expenses, and for what?		
Superintendent, $1200; treasurer, $400; clerk, $300,	1,900	00
Dividend declared, and when?	00	00
Balance of money in hand,	11,258	37
Debts due by the company,	6,498	00
Debts due to the company, otherwise than on account of stock,	355	00

Sent to the Board of Public Works of the State of Virginia, by order of the president and directors of the Roanoke navigation company.

A. JOYNER, *Clerk*
Roanoke Navigation Company.

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RICHMOND DOCK COMPANY.

RICHMOND, Dec. 6th, 1823.

JAMES BROWN, Jr. *Secretary*
to the Board of Public Works,

SIR,

Since their last report to the Board of Public Works, the Richmond Dock company have been diligently engaged in strengthening their works, and in advancing their progress towards completion; but, all apprehension of final success having been dissipated, the efforts of the president and directors during the year, were directed more to rendering secure and permanent what had been already done, than to the constructing of new works, which, though necessary, could, without injury, be delayed. They therein consulted what they considered the best interests of the company, without regard to making any display of work, and superficial observers, perhaps, will think but little has been done; for to such, the change produced by the incessant labor of a large and well applied force during nearly the whole of the year, would be scarcely perceptible.

The dredging machines attached to the two steam engines, have been very generally employed in deepening the channel below the lock, and in preparing the site for the extensive wharf, contracted for and nearly ready to be put down along the northern bank of the river below the works. The quantity of sand raised, is almost incredible; it was boated from the machines to the south bank of the dock, from 18th street downwards, which it was used to raise, widen and strengthen. Large quantities of clay were thought necessary in some places, to the entire security of the south bank, and were transported from the north side, to the situation wanted. A brick house for the use of the lock-keeper, has been built on the works convenient to the lock; some stone wall has been built, which will serve to shew the height and thickness of that contemplated around the whole inner side of the works, to enable the directors to raise the water in the dock to the greatest height required by law. A draw-bridge has been constructed, and is now ready to be erected across the dock at 18th street; but, as it is necessary to first deepen the site for its erection, it is feared it cannot be raised until the spring. The dam at the head of the canal of Messrs. Haxalls, has been repaired, and generally such other repairs as were wanted, have been made.

On the night of the 8th—9th of September last, torrents of rain fell, which broke the dam of a mill-pond, and of some ice ponds up Adams's valley; the accumulated waters of which, were precipitated into the basin of the dock in such quantities and with such rapidity, that the waste was wholly inadequate to discharge them, and they found their way over the works along side of the lock, carrying with them large quantities of earth into the channel below, and on Sunday the 28th of the same month, another violent rain occurred, which owing to the negligence of the lock keeper in not opening the wicker-gates in time, overflowed the works in about the same place, but with more injury to the company, as they have been almost ever since engaged in removing the earth then washed into the channel. The lock-keeper has been discharged, and it is hoped that even without the relief of another waste, care and attention will guard the works against the recurrence of such an accident. The treasurer's statement hereto annexed, and prayed to be taken as a part of this report, shews the gross amount of tolls which accrued from the first day of February, to the first day of December, 1823, at $ 3,788 11, of which the sum of $ 3,672 85, has been collected. The president and directors, though disappointed in the amount, see nothing to alarm them, or to weaken the belief they have all along entertained of the future income. Many circumstances have conspired to reduce the amount of tolls, even if the works of the company had been constantly accessible to vessels. Among others, the various conflicting interests to be overcome of the wharf-owners at Rockets and above, who, naturally anxious to use all honest and fair means to retain their income, by reducing their charges of wharfage very low, &c. &c., induced vessels to load and unload where they had been accustomed, instead of using the dock. The dock company of course, reduced their rates somewhat, nor have they ever made any charge on the vessels, as is allowed to them by law, but have confined their tolls to wharfage on merchandize; but the operations of the company rendered it necessary at times, to draw off the water from the canal and basins, and at other times the passage of vessels in and out, was found to interfere so much with the machines digging in the channel, that it was necessary to forbid them for a time, entrance into the dock.

It would seem, therefore, that the receipts of tolls heretofore, can be no fair criterion, by which to judge of their future productiveness.

Respectfully,
(Signed,) J. B. HARVIE,
President Richmond Dock Company.

Return of the state of the Richmond Dock Company, on the 6th day of December, 1823.

Capital subscribed,	$ 250,000 00
Aggregate of requisitions made on the stockholders,	250,000 00
Amount paid by stockholders,	245,384 07
Amount due by the Board of Public Works,	00 00
Amount due by individual stockholders, $ 3,567 25, in suit in superior court of chancery, for the Richmond district, and $ 176—and $ 873 68, as heretofore reported,	4,615 93
Capital expended in the work,	312,385 97
Tolls received from the 1st day of February, to the 1st day of December, 1823. (The	

whole amount which accrued during the period, was, $ 3,788 11, of which $ 115 26, is uncollected,)	3,672 85
Sums expended out of the tolls, in repairs and improvements. (The tolls received, were applied in common with other funds to the uses of the company,)	00 00
Officers' salaries, and expenses of collecting tolls, (in detail.) Superintendent $ 1,200; collector of tolls $ 750; clerk and treasurer $ 500; overseer $ 500; lock-keeper $ 250 per annum,	3,200 00
All other expenses and for what?—materials, tools, labor, cloathing, sustenance, debts, cost of suits, interest, &c. in every variety and great number of items,	00 00
Dividends declared, and when?	00 00
Balance of money on hand,	9,874 92
Debts due by the company, $ 35,203 97, and the amount received, and to be received, on loan from the Board of Public Works,	35,203 97
Debts due to the company, otherwise than on account of stock,	516 50

E. E.

(Signed,)

H. BAKER,
Treasurer of the Richmond Dock Company.

Note.—The superintendent informs me, that the negro hire for the current year, which will fall due early in January, 1824, will amount to about $ 5,000—that the winter clothing is yet to be provided—that the sum of $ 2,500, will be falling due on the contract for the long wharf below the works, and that accounts, not yet presented for articles furnished, and amounts becoming due on contracts now in progress of execution, will be also falling due.

LEESBURG TURNPIKE ROAD COMPANY.

LEESBURG, Nov. 29th, 1823.

To the President and Directors of the Board of Public Works for the State of Virginia.

GENTLEMEN,

Enclosed, you will receive a statement of the affairs of the Leesburg turnpike road up to the 1st December, 1823.

I am, gentlemen, very respectfully,
Your obedient servant,
(*Signed,*)
JN. ROSE, *President.*

Return of the state of the Leesburg turnpike road company on the 1st day of December, 1823.

Capital subscribed,		$ 84,000 00
Aggregate of requisitions made on stockholders,		50,400 00
Amount paid by stockholders,		46,332 05
Amount due by the Board of Public Works, nothing,		00 00
Amount due by individual stockholders,		4,067 95
Capital expended in the work, (the whole amount subscribed.)		
Tolls received from the 1st day of July, 1822, to 1st July, 1823,		3,152 78
Expended out of the tolls in improvement and repairs,		610 38
Officers' salaries and expenses of collecting tolls, viz.		
To John Rose, president,	$ 100 00	
To four directors, $ 25 each,	100 00	
To treasurer's commission for receiving and paying,	62 20	
To two gate-keepers, $ 150 each,	300 00	
Fuel,	23 98	
		586 18

All other expenses, viz.

Interest on $ 2,000, due Enoch Francis, for 13 months,	130 00	
R. H. Henderson for attorney's fees,	20 00	
Charles Binns' clerk's fees,	00 80	
For printing,	20 00	
Cash for serving notices,	8 50	
Interest on $ 6,000 due the Leesburg bank, from the 9th August, 1822, to the 22d August, 1823,	371 22	
Surveyor,	1 50	
		552 02
Dividend declared 1st July, 1823, being three per cent. per annum, on amount paid in by individual stockholders,		1,299 15
Balance of toll-money on hand,		105 00

Debts due by the company, viz.

To the Leesburg bank,	4,000 00	
To Enoch Francis,	900 00	
To John McAleer & Co., for making road,	361 00	
To James McKendrick & Co., for do.	295 22	
		5,556 22
Debts due to the company, other than from stockholders,		00 00

(*Signed*,)

THOMAS R. MOTT, *Treasurer.*

◆

FALLS BRIDGE TURNPIKE COMPANY.

Return of the state of the Falls Bridge turnpike company, on the 6th day of December, 1823.

Capital subscribed,	$ 80,521 40
Aggregate of requisitions made on stockholders,	64,521 40
Amount paid by stockholders,	60,269 42

Amount due by the Board of Public Works,		16,000	00
Amount due by individual stockholders,		4,251	98
Capital expended in the work,		76,116	29
Tolls received from 7th December, 1822, to the 1st December, 1823,		694	37
Sums expended out of the tolls in improvements and repairs,		210	78
Officers' salaries and expenses of collecting tolls in detail:			
Treasurer,	$ 100 per annum,		
Toll keeper,	250		
Superintendent,	200		
		550	00
All other expenses and for what?			
Printing, measuring work done by contractors, and lumber used in repairing bridges,		152	71
Dividends declared and when? None,		00	00
Balance of money in hand,		289	18
Debts due by the company,		29,513	45
Debts due to the company other than from stockholders? None,		00	00

SIR,

Above is a statement of the affairs of the Falls Bridge turnpike company. There is an unsettled balance due one of the contractors, in addition to the $ 29,513 45, mentioned as the amount of debt due by the company, amounting, probably, to from one to three thousand dollars.

Very respectfully, I am, sir,

Your obedient servant,

(Signed,) J. MASON, JR.

President Falls Bridge turnpike company.

To J. BROWN, Jr. *Secretary*
to the Board of Public Works.

SNICKER'S GAP TURNPIKE COMPANY.

Return of the state of the Snicker's Gap turnpike company, on the 8th day of April, 1823.

Capital subscribed,		$64,375 00
Aggregate of requisitions made on stockholders,		64,375 00
Amount paid by stockholders,		62,414 23
Amount due by the Board of Public Works,		00 00
Amount due by individual stockholders,		1,960 77
Capital expended in the work,		82,030 47
Tolls received from the 6th day of April, 1822, to the 8th day of April, 1823,		1,212 44¼
Sums expended out of the tolls in improvements and repairs,		573 19¾
Officers' salaries, and expenses of collecting tolls, (in detail:)		
Treasurer's commission of 2 per cent. on amount of tolls,	26 69½	
Gate-keepers' salaries,	410 00	
		436 69
All other expenses, and for what?		
Expenses at the several meetings,	14 00	
Postage of letters, &c.	1 32½	
Printer's accounts,	6 50	
Writing paper,	50	
		22 32½
Dividends declared, and when?		00 00
Balance of money in hand,		420 37½
Debts due by the company,		16,291 46¼
Debts due to the company other than from stockholders,		00 00

A true copy from the books of the Snicker's Gap turnpike company.

N. C. WILLIAMS, *Treasurer.*

Gentlemen,

I transmit to you the foregoing statement of the progress and condition of the Snicker's Gap turnpike road.

D. CASTLEMAN, Jr.

President of the Snickers' Gap turnpike company.

Richmond, 27th November, 1823.

To the President and directors of the Board of Public Works.

MONONGALIA NAVIGATION COMPANY.

Return of the state of the Monongalia Navigation Company on, the 15th day of November, 1823.

Capital subscribed,	$ 35,000 00
Aggregate of requisitions made on stockholders,	21,283 00
Amount paid by stockholders,	13,668 00
Amount due by the Board of Public Works,	3,046 00
Amount due by individual stockholders,	4,569 00
Capital expended in the work,	13,768 00
Tolls received, none,	00 00
Sums expended out of tolls, in improvements and repairs, none,	00 00
Officers' salaries and expenses of collecting tolls, none have yet been allowed,	00 00
All other expenses and for what? Not ascertained,	00 00
Dividends declared and when, none,	00 00
Balance of money in hand. There are in the hands of the treasurer to be accounted for	930 00
Debts due by the company. There is due to J. G. Jackson of the third instalment on his contract, the sum of	5,150 00
Debts due to the company other than from stockholders, none,	00 00

Teste, WM. MARTIN, *President.*

John Jackson, *Secretary.*

CARTERSVILLE BRIDGE COMPANY.

Powhatan, January 8th, 1823.

Sir,

I send, herewith, a report from the board of managers of the Cartersville bridge company, of the affairs of said company, and of the condition of the bridge. I have to apologise for not making this report at an earlier day; and I offer for it, this consideration, that the whole work being near its completion, the board thought it best that the report should be postponed until all their operations and accounts could be exhibited in one view; and it was conceived not to be very material, (as no revenue from the bridge has yet accrued,) whether the report was handed in at the first meeting of the Legislature, or at any after-time during their present session. I have, too, individually, to express my sincere regret that all the stockholders have not paid up their different requisitions with the punctuality observed by the Board of Public Works. This appears from the treasurer's account, annexed to the report of the board of managers, and is to be accounted for in the peculiar pressure of the times during which this bridge has been built, as well as the death of two of the stockholders, whose estates, from particular causes, were not immediately taken into the management of their legal representatives. My little experience, as president of this company, consisting only of 19 stockholders, (most of them my personal friends,) and all of them deemed highly respectable, urges me, (though I do it with sincere deference,) to make one suggestion to the Board of Public Works, under whose forecast and patriotic exertion the internal improvement of our country is so fast progressing. It is this: that it should be recommended to the Legislature to pass a general law, providing, that when the State becomes a party with individual stockholders, in any work of internal improvement, no requisition should be paid by the State, unless accompanied by an affidavit from the president and treasurer of such company, that a like requisition had been made on, and actually paid, by every stockholder. An exception might be introduced into the law, to embrace the case of the death of a stockholder or stockholders, inasmuch as it would be bad policy for the Commonwealth to withhold her patronage or funds from a whole company, because, perhaps no person had qualified on the estate of a deceased stockholder, so as to legalise a motion to sell his stock for a delinquency in meeting a requisition.

The rule I have suggested, might sometimes operate hard on particular companies, because of the insolvency or obstinacy of some of their members; but, I am clearly of opinion, that any evil of this kind would be much more than counterbalanced by the preservation of the fund for internal improvement, and the application of it, which would thereby be ensured, to great, and (if I may use the expression,) to bona fide objects only.

With very great respect and esteem,

Your obedient servant,

(*Signed,*) TH. MILLER.

To the president of the Board of Public Works.

The board of managers of the Cartersville bridge company, submit to the Board of Public Works for the State of Virginia, the following report of the affairs of said company, and of the condition of the bridge:

That the Board of Public Works may have a full view of the proceedings of the Cartersville bridge company, the board of managers now lay before them the journal of said proceedings from the original subscription of the stock to the completion of the bridge, under the expectation, however, that after it shall have been examined by the Board of Public Works, it will be returned to them.

By the journal aforesaid, (page 16,) it will appear, that the first contract made with David Scott of Maryland, the undertaker of the bridge, (to execute which he gave bond with approved security,) amounted to $ 16,800. The terms of payment, the nature of the work, the dimensions of the bridge, kind of timber, rock, masonry, &c., are fully set forth in the contract, as will be seen by reference to a copy of it on the page aforesaid in the journal.

On the 31st day of May, 1821, the board of managers, after mature deliberation, determined to increase the height of the piers of the bridge considerably, and at the same time to reduce their number from seven to five. It thereby became necessary to make a new contract with the undertaker, so as to embrace this alteration, and any additional work or cost which might be required in making it. This was done by an agreement on the day aforesaid, between the board and the undertaker, a copy of which is referred to in the journal, (page 21.) By this agreement the extra work and cost were estimated at $ 500.

On the 13th day of December, a contract was made for roofing the bridge at $ 5,000; four thousand to be paid in money, and the other thousand either in stock of the company, or out of the first tolls received from the bridge, at the option of the undertaker; he has selected the tolls. On the same day, (viz: 13th December, 1821,) a contract was made between the same parties for a road to the bridge through Cartersville and across a small ravine, and the flat land adjacent to the river bank. Copies of these contracts will be seen by reference to the journal, (page 25 and 26;) and it will also appear, that with regard to the road to the bridge, the board of managers and David Scott, not being able to agree upon terms, it was stipulated that he should execute the work and it should be valued, when finished, by disinterested persons mutually selected, and the board forthwith appointed their valuator: this gentleman could not, (from his public engagements,) attend, when he was requested to value the work, and in consequence thereof, the board had to select another to supply his place. The valuation was completed on the 27th of November last, as will be seen by a copy of the award of the valuators, (journal, page 33,) and the work was estimated at one thousand twenty-five dollars and twenty-seven cents; since that day, the undertaker has exhibited another account for extra work, viz: gates to the bridge, railing on the wing walls, painting the ends of the bridge, &c., amounting to $ 182; this account has not yet been settled, but it is believed to be nearly correct. From the foregoing remarks and references, it appears that the various contracts with David Scott, the undertaker of the bridge, stand thus:

No. 1,	Contract	for main bridge,	$ 16,800 00
No. 2,	Do.	for alteration,	500 00
No. 3,	Do.	for roofing,	5,000 00
No. 4,	Do.	for road, (award,)	1,025 27
	Account for extra work,		182 00
			$ 23,507 27
To this, add salary of treasurer for two years,			400 00
Expense of law suit with Goochland county court, (see treasurer's account annexed,)			55 00
F. & F. Deane's account, see same,			33 75
	Amount carried forward,		$ 23,996 02

By amount brought forward,	$ 23,996 02
Add debt due R. Harrison for 800 perches of rock, at 8 cents per perch,	64 00
So that it appears, all the costs of the bridge and its appendages so far contracted for, amount to this sum,	24,060 02
By the account of the treasurer of the Cartersville bridge company hereto annexed, and which it is wished may be taken as a part of this report; the whole stock of the company subscribed for, amounts to	22,600 00
Leaving the company indebted this sum,	$ 1,460 02
It will be necessary also, as soon as possible, to have erected a good and substantial toll-house, and the cost of that with the land that it will occupy, has been estimated at	600 00
	$ 2,060 02
So that the bridge company, will have either to borrow the sum of two thousand and sixty dollars, to fulfil their engagements and build a toll-house; or the first tolls from the bridge, must be applied to these objects. The tolls due to Scott, have been estimated in this report, as a debt of the company; this deficiency will be lessened in a small degree by the recovery of the costs of the suit with Goochland county court, which was determined in favor of the company in the court of appeals. These costs, will probably amount to	30 00
Real deficiency,	$ 2,030 00

With regard to the condition of the bridge, the board of managers beg leave to say that it will appear from the manner in which they finally received the bridge, (see journal page 29, 31 and 34,) that they were not completely satisfied with the execution of the work, especially with what related to the weather-boarding of the sides of the bridge, but that under all the circumstances of the case, they deemed it better to receive it, than to travel to Maryland to sue the securities; or to have a long law suit, (if sued by the undertaker) in their own State. He has spent upwards of two years in fulfilling his contracts, and it is not believed that he will make any thing by them. The main parts of the bridge, (including all the masonry,) are executed in the best style, agreeably to the opinions of the most competent judges of such work, and all the timber, particularly that in the body of the bridge, is of prime quality. To conclude: the board of managers cannot refrain from expressing the belief, that the Cartersville bridge exhibits the most permanent and elegant specimen of architecture of its kind within this Commonwealth, and they indulge the hope that it will become, and long continue a useful and profitable monument as well of individual enterprize, as of the patronage of a just and enlightened government.

All of which is respectfully submitted.

(*Signed,*) TH. MILLER,
President Cartersville Bridge Company.

Cartersville, January 8, 1823.

Cartersville Bridge Company, in account with Francis B. Deane, Junr., Treasurer.

1821—To amount paid David Scott, contractor, as per account, settled with the board of managers 30th May, 1821,	$4,131 00
To paid same, as per account, settled with same 27th October following,	3,451 80
To paid same, as per account, settled with same 14th November, 1822,	7,896 71
To paid same, as per account, settled with same 24th December following,	1,828 38
1823—Jan. 3, To paid same, as per vouchers herewith furnished, marked H. No. 1 to 4,	829 30
Amount carried forward,	$18,137 19

	By amount brought forward,		$18,137 19
	Disbursements on account of the Company.		
1823.			
Jan. 3,	To this amount paid A. Brice, his fee in application to the court of Goochland for a road to the bridge,	$15 00	
	To paid F. & F. Deane, their account with company,	33 75	
	To paid John Robertson, his fee in suit in the court of appeals,	40 00	
	Allowed treasurer, for 2 years salary, due 14th June, annually,	400 00	
			488 75
30,	To balance due,		3,984 06
			$22,600 00

CR.

1821.			
Oct.	By stock subscribed by individuals,	$17,600 00	
June,	By stock subscribed by the Board of Public Works,	5,000 00	
			22,600 00

E. E.

Cartersville, January, 1823.

(*Signed,*) F. B. DEANE, Jr.

Treasurer C. B. Company.

1823.		
Jan.	By the above balance brought down subject to collection,	$3,984 06

Note.—Out of the above balance of $3,984 6-100, the treasurer has assumed on account of the stockholders, to various individuals who have taken orders on him from the contractor as payment of their claims, three thousand five hundred and forty-six dollars, and ninety-two cents, which of right should be considered as so much paid on account of stock, because such assumpsits are held by, or will be assigned to the stockholders.

(*Signed,*) F. B. D. *Tr. C. B. Co.*

CARTERSVILLE BRIDGE COMPANY.

At a meeting of the board of managers of the Cartersville bridge company, convened at Zachariah Taylor's tavern, in the town of Cartersville, on the 26th day of November, 1823: the board being organized according to law, &c. &c.

Resolved, That the following report be transmitted as the annual report of the managers to the Board of Public Works for the State of Virginia.

Return of the state of the Company on the 26th day of November, 1823.

Capital subscribed,	$ 22,600 00
Aggregate of requisitions made on stockholders,	17,600 00
Amount paid by stockholders,	17,600 00
Amount paid by Board of Public Works,	5,000 00
Capital expended in the work,	24,100 00
Amount borrowed from the Bank of Virginia,	1,500 00
Amount paid do. for curtail and discount,	226 40
Tolls received from 24th December, 1822, till 26th November, 1823,	454 55
Debts due by the company,	1,473 46
Debts due to the company, (annual customers 1st January, 1824,)	250 00
Officers' salaries and expenses of collecting tolls annually,	265 05
Balance in treasurer's hands,	164 00

TH. MILLER, *President.*

It will appear from the foregoing exhibition of the Cartersville bridge company, that as yet there has been no dividend on the stock, and that the sum of 1,223 dollars is due by the company. It is proper to remark, that the stock of the bridge company has not, as yet, been near so productive as its friends anticipated. This proceeds, in some degree, from the distressed condition of the country in pecuniary matters, but more especially from the opposition of the ferry owned by Randolph Harrison, esq. at Cartersville, commonly called Carter's ferry. The ferriage has been reduced one half since the bridge was passable; and the road to the bridge passing on the north side of the river along its bank immediately by the ferry-landing, enables the ferry-men to forestal many of the travellers. As this rivalry operated much to the injury of the bridge company, without, (as is believed,) greatly advancing the interest of the proprietor of the ferry, the stockholders determined, at a meeting on the 21st day of July, to attempt a purchase of the ferry and its appendages. Accordingly, a negociation was opened on the part of the stockholders, by their committee, and the result of their efforts will appear by reference to copies of their letter to Mr. Harrison and his answer, herewith transmitted, and marked A. and B. It is to be observed, that a proposition was made to Mr. Harrison at this late period, not because of any unwillingness on the part of the stockholders to meet him in a spirit of conciliation and harmony, as he seems to think, but principally because of the difficulty of sooner procuring a full meeting of the stockholders; so full a meeting as the managers thought should act on such an important subject. It was, moreover, not deemed material, that any proposition should be made at an earlier date, because it was not expected that any bargain which might result would be carried into effect before the commencement of the next year, inasmuch as both the company and the proprietor had made their arrangements for the present year, by annual contracts, with many persons in the neighbourhood, which it would have been improper to interrupt.

The managers farther state, that if a road could be opened from the north abutment of the bridge, straight on to the line of the grand canal contemplated, and thence out to the main northern and southern road, the interest of the bridge company, and of the Commonwealth, as a stockholder, would not only be greatly advanced, but travellers would be furnished with a shorter and much better way than the very hilly one which at present they are compelled to use. The Cartersville bridge company feel considerable reluctance in making the usual application to the court of Goochland, on the subject of this road, which would be of great public advantage, as any member of your board, acquainted with the subject, must know, because of the serious opposition which their application for a road from the ferry up the river bank, *only a few hundred yards*, to the northern abutment of the bridge, encountered from said court. Even this short road could be obtained *only by a resort to the court of appeals*, notwithstanding the plain letter of the law on the subject. The managers of the Cartersville bridge company, under these circumstances, respectfully solicit the advice and aid of the Board of Public Works, in procuring the establishment of the road above-mentioned, as well as their opinion upon any point touching the interest of the said company.

(*Signed*,) TH. MILLER, *President.*

JOHN G. DANIEL, *Secretary.*

[A.]

CARTERSVILLE, August 30, 1823.

Mr. R. Harrison,

SIR,

At a meeting of the stockholders of the Cartersville bridge company, at Zachariah Taylor's tavern, on Monday the 21st day of July last, a resolution was adopted, appointing Thomas Miller, Thomas Pemberton, Samuel Wilson, Francis B. Deane, and John G. Daniel, a committee (or any three of them,) for the purpose of purchasing from you your ferry across James river, (commonly called Carter's ferry,) with all the lands and houses on each side of the river connected therewith. Under the aforesaid resolution, the undersigned offer to you the following proposition: The Cartersville bridge company will give you, for the ferry and appurtenances above named, six thousand dollars, payable in the following manner, viz: The unsubscribed shares of the company, (say 24 shares,) twenty-four hundred dollars, and thirty-six hundred dollars in four equal annual instalments. A complete fee simple estate to be secured in the ferry, land, and houses aforesaid, to the company; and nothing more to be pledged for the payment of the purchase money, than the annual proceeds from the bridge and ferry. The undersigned farther say, that Mr. F. B. Deane is willing to give to the company the lot of land on the south side of the river (now enclosed) for the erection of a toll-house and other buildings, without any restriction whatever, provided this proposition is acceded to by Mr. Harrison.

The undersigned make this latter state[illegible] obviate a difficulty which, they understand, was sugg[illegible] Mr. Harrison in a conversation with one of the [illegible] It may not be improper to remark, that this comm[illegible] has been postponed to the present time, in consequence of the bad health of one of the committee, when Mr. Harrison was last in Cumberland. The undersigned have now only to request from Mr. Harrison as early an answer to this communication, as his convenience may authorise.

Respectfully, your obedient servants,

THOMAS MILLER,
THOMAS PEMBERTON,
JOHN G. DANIEL,
F. B. DEANE.

N. B. The bonds to carry interest from the date, if not punctually paid.

[B.]

CLIFTON, September 7th, 1823.

Messrs. Thomas Miller, Thomas Pemberton, John G. Daniel, and F. B. Deane,

GENTLEMEN,

Your favour of 30th ult. conveying the terms on which you are willing to purchase my ferry, was handed to me on the 2d instant, and I avail myself of the first leisure time to reply to it as you request. In declining to accept these terms, I think it proper to state the reasons which govern me. It is now six months, (I think it was about the 8th of March) since, in a spirit of conciliation, a proposition was made to me by capt. Pemberton for a compromise of the conflicting interests between the Cartersville bridge and ferry. In the same spirit I frankly met him, and in a few days after intimated my willingness to accept such terms as you now offer. He left me with an understanding that the subject should be laid before the stockholders of the bridge as soon as practicable, and I told him that as I should necessarily be very much in Richmond, and upon the canal, Mr. William Randolph should have power to act for me. Nevertheless, although I heard from time to time, that the subject was agitated among the individual stockholders, it was not acted upon, and it was so apparent to me, that the company, if not disinclined to a compromise, were at least very indifferent about it, that I at length desired Mr. Randolph, if he considered the proposition as being before them, to withdraw it. I was soon afterwards informed by Mr. F. B. Deane, Jr. that a committee of five members, which he named, was appointed to treat with me. A short time after this, in a conversation with two of your members, captain Pemberton and Mr. Daniel, the former remarked that my price for the ferry was too high, and I must come down. A day or two after this, on the 17th ult., I was requested by another of the committee, (Mr. Deane) to wait upon him the next day at his house, which I accordingly did. He then, after premising that he did not mean to chaffer, proposed terms to me, which, though not official, were declared to be the best that could be obtained in his opinion, and these not without strong opposition. These were, that for my ferry, and two acres of ground, with a grocery, granary, ferry-house, and the bank and ferry-house on the north side, my ferry-boats and all appendages, I should receive twenty-four shares of bridge stock, and twenty-six hundred dollars in four annual payments without interest. During the discussion, when speaking of the company's having no ground to build a toll-house upon, he declared that no body had a right to ask, nor would he ever yield an unconditional right to any person, for that purpose. I asked him, if he was certain that no better terms could be obtained than what he offered. He repeated that he was, and these not without difficulty. I was now satisfied, from all the circumstances, that my motives had been mistaken; that while I was disposed to make a sacrifice of what I conceived to be my pecuniary interest, for the sake of harmony with my neighbours, every effort was tried to bring me down to the lowest possible terms. I then finally told Mr. Deane he might consider the negociation at an end. Then, said he, the contest must go on. I replied, that it must be so; I was prepared for it. It was not from any desire to own the stock that I was induced to agree to take it, but as a matter of accommodation to the bridge company. I have now no disposition to become a stockholder; nor am I willing to defer the payment of any part of the purchase money for my ferry, without the regular payment of interest. I therefore suppose it would be useless to make any proposition to you.

I am, respectfully,

Your most obedient,

RANDOLPH HARRISON.

LYNCHBURG AND SALEM TURNPIKE COMPANY.

To the honorable the president and directors of the Board of Public Works of the State of Virginia.

The memorial of the stockholders of the Lynchburg and Salem turnpike company, respectfully represents, that on the 7th day of February, 1818, the General Assembly of Virginia passed an act, incorporating a company to establish a turnpike road from Lynchburg to Salem; authorising subscriptions for completing the same, to the amount of $ 100,000, agreeably to the provisions of an act, entitled, "an act prescribing certain general regulations for the incorporation of turnpike companies." Your memorialists state, that the subscription was nearly completed for the sum above mentioned, and the company duly organized; but, that owing to the great change in the condition of the country, from the period of the incorporation to the present time, many of the original subscribers have entirely failed, so as to reduce the amount of solvent subscriptions to about $ 70,000. Your memorialists further state, that they have had great difficulties to encounter in the prosecution of the said road, arising from the failure of the contractors, from the obstacles thrown in the way by many of the original stockholders, (who refuse to make payment until compelled by a course of law,) and from the want of experience in the construction of turnpike roads. Your memorialists, however, state, that they have succeeded in removing many of the difficulties in the way of the prosecution of the said road; that they have completed two entire sections of the said road, and are now progressing on the third section, without any assistance, as yet received, from the State. Your memorialists have paid the sum of $ 37,935 02; commencing in 1818 and ending in the present year, being a period of great pecuniary embarrassment, which payments have been made in many instances at great sacrifices, and that they have received as yet, very small dividends on their stock. They beg leave further to state, that by the terms of the general turnpike law above referred to, their charter would be forfeited, unless the road should be completed in ten years from the time of its incorporation; and that the sum of $ 100,000, the amount authorised to be subscribed, is entirely insufficient to complete the said road. Of the insufficiency of the said sum of $ 100,000 to complete the said road, they were entirely ignorant at the time they subscribed for the stock. Your memorialists further state, that on the 17th day of February, 1823, another act was passed by the General Assembly, in relation to the said turnpike company, authorising your honorable body to subscribe on behalf of the State for 300 shares of stock, upon the following condition, among others, that "the General Assembly reserve the right to apply at any future day, the tolls to the future extension and completion of the said road." Your memorialists humbly represent, that the fund subscribed not being sufficient to complete the said road, and their charter being liable to be forfeited in consequence thereof; and, believing that the said road, when completed, would greatly advance the interests of the country in which they live, and of the State generally, they have thought it advisable to accept the proposition of the State, in relation to the subscription of 300 shares of the stock, upon the terms specified in the last mentioned act, and have directed their assent to be notified to your honorable body. Under these circumstances, your memorialists think it but reasonable, that the said last mentioned act be so modified, as that the General Assembly shall not reserve the right to appropriate the tolls to the extension and completion of the said road, without the approbation of your memorialists; or, at all events, that they will only reserve the right to appropriate a reasonable portion of said tolls. Your memorialists state, that many of them have embarked a large proportion of their property in the stock of this company; and that it would be almost ruinous to them to be placed in a situation in which they would receive no dividends upon their stock until the completion of the said road. Your memorialists, therefore, pray, that your honorable body would recommend to the General Assembly the modification of the said last mentioned act, *so as that the General Assembly shall not reserve the right to apply the tolls to the further extension and completion of the said road, without the approbation of your memorialists, or that they will reserve the right to apply only a reasonable portion of the tolls to the said object.* Your memorialists beg leave to suggest, that it would, in their opinion, be more proper to constitute a new company, for the purpose of extending and completing the said road, from the point to which their funds, aided by the fund subscribed by the State, will carry it. And your memorialists, as in duty bound, will ever pray.

C. DABN[illegible]
WM. RA[illegible]

Committee appointed on behalf of the stoc[illegible]
Lynchburg [illegible] *tu*[illegible]*y.*

December 1, 1823.

A statement taken from the treasurer of the Lynchburg and Salem turnpike company's book, shewing the amount paid by the stockholders of the said company in each year, viz:

From the 1st day of October, 1818, till 31st December, 1818, both days inclusive,	$8,840	00
From the 1st day of January, 1819, till 31st December, 1819, both days inclusive,	5,396	00
From the 1st day of January, 1820, till 31st December, 1820, both days inclusive,	4,453	50
From the 1st day of January, 1821, till 31st December, 1821, both days inclusive,	5,687	34
From the 1st day of January, 1822, till 31st December, 1822, both days inclusive,	8,791	02
From the 1st day of January, 1823, till 10th November, 1823, both days inclusive,	4,767	16
Total,	$37,935	02

1822.
June 12th, A divid'd of $2 on each share of stock was declared.
Dec. 12th, do. 1 do. do. do.
1823.
June 12th, do. 2 do. do. do.

(*Extract from the book.*)

JOHN LYNCH, *Treasurer.*

* * *

At a meeting of the stockholders of the Lynchburg and Salem turnpike company, at the Franklin Hotel, in the town of Lynchburg, on the 4th day of October, 1823, Thomas A. Holcombe was called to the chair, and Samuel T. Miller nominated secretary.

The ballot for choosing a president of the company for the ensuing year being held, William Davis, sen. was elected.

The ballot for choosing five directors, for the same period, being then taken, it was ascertained that the following gentlemen had a majority of votes, viz: John Watts, Alexander Austin, Thomas A. Holcombe, Richard Tyree, and James Butler.

On motion *Resolved*, That this company accept of the terms affixed by the State of Virginia, by a law passed the 17th February, 1823, for increasing the capital of the company, &c.

And that the president and directors duly inform the Board of Public Works of this their acceptance, at the next meeting of that board.

WM. DAVIS.

Test,

JOHN LYNCH, *Clerk of the Lynchburg and Salem turnpike company.*

At a meeting of the stockholders of the Lynchburg and Salem turnpike company, at the Franklin Hotel, in the town of Lynchburg, on the 4th day of October, 1823:

Resolved, That William Radford, Chiswell Dabney, and Richard Pollard, or any two of them, be appointed a committee to prepare and present a memorial to the next General Assembly of Virginia, respectfully requesting that the said act of the General Assembly, passed on the 17th day of February, 1823, be so changed that the General Assembly shall not have the right of appropriating the tolls of the said company to the extension and completion of the said road, without the assent of the company, or that the law be so modified, that only a reasonable proportion of said tolls be appropriated in that manner.

Resolved, That a like memorial be presented by the said committee, on behalf of this company, to the Board of Public Works, respectfully requesting, that they will aid the said company in the said change of the above act of Assembly, in such manner as they shall deem reasonable.

Extract from the minutes.

JOHN LYNCH,
Clerk Lynchburg and Salem turnpike company.

COMMISSIONER'S REPORT

ON THE

JAMES AND JACKSON'S RIVER CANAL,

WITH THE ACCOMPANYING DOCUMENTS.

Mr. Speaker of the House of Representatives,

I beg leave to present through you, to the House of Representatives, my report as commissioner of the James and Jackson's River Canal.

RANDOLPH HARRISON.

4th December, 1823.

To the General Assembly of Virginia.

In conformity with an act, making more effectual provision to carry into effect the act, entitled, "an act to amend the act entitled, 'an act for clearing and improving the navigation of James river, and for uniting the eastern and western waters by the James and Kanawha rivers, and for other purposes," the commissioner of the James and Jackson's river, most respectfully reports:

That after the necessary preparation for entering on the duties of his office, he proceeded to the appointment of Mr. Moncure Robinson as his engineer. Having then employed Maj. John Staples as general superintendent of labor, and purchaser of materials, with instructions to engage a competent force, for widening and deepening the old canal; his next, and most important care was, to give a thorough investigation to the plan of operations then in progress, under the direction of the James river company, and the alterations proposed by their engineer col. John G. Gamble, which will be seen in the accompanying report to the commissioner marked A. as well as in his remonstrances to the James river company, referred to in the said report, as also in the reply of the president of that board; which last documents will be found in the 2d auditor's office. The very high respect which is due to the opinions of these two gentlemen, was well calculated to excite much anxiety and uneasiness in the commissioner, who was to decide upon questions so important to the navigation. The most mature deliberation was, therefore, used on a critical examination of himself and his engineer. He will take occasion here to remark, that he was among the commissioners who were required on the 12th of July, 1820, to view the change which was proposed in the original plan of Moore and Briggs, according to a report of Isaac Briggs, engineer to the James river company, which was laid before them. Eight out of nine of the commissioners were present. They employed two days in examining it, and unanimously approved of it, except that part which related to the plan of locking down into the river at Ball's sluice, which was rejected. This was afterwards adopted on another view, when your commissioner was not present, and a contract made with John Dalton, for the execution of the locks, from which he did not withhold his sanction. The saving of $20,000, was, to be sure, an important consideration, but deeming it always bad policy in canal navigation, to expose the main line of commerce to the fluctuations of the river, the commissioner, after he came into office, determined to continue the level to a site below the arch, and lock down under the protection of the guard gate. The contract with Dalton was therefore annulled, a new one made, and twenty-five hundred dollars allowed him for the work done, and the expense of removing his materials.

With regard to the use of Tuckahoe ravine as a part of the canal, we were of opinion it would be very impolitic to abandon it. The dam across James river, at Fore's fish-dam, is calculated to furnish a supply of water to the principal line, from the arch to Wickham's bridge, a distance of 7 miles 52 chains, viz: 3 miles 10 chains to the guard lock at Ferguson's fish-pond; 1 mile 46 chains from thence to the middle mouth, and 2 miles 77 chains from thence to Wickham's bridge.

The plan proposed by col. Gamble, would retain only 3 miles 10 chains of this, viz. from the arch to the fish-pond, which would be altogether excavation and embankment, and consequently exposed to injury from freshes; and abandon 4 miles and 43 chains of natural banks, which cannot be broken, though during freshes the navigation may for a short time be impeded, as it will in a portion of every line of canal, where the water is received from the river. The idea of the inconvenience which is so much dreaded, of its being filled with sand and mud from the adjacent lands, does not appear to be well founded. The high land generally is not much mixed with sand; and that portion of the soil which is sand, when brought down by washing rains, is, by its gravity, deposited before it reaches the ravine, which is situated in low grounds nearly all the way, at a considerable distance from the foot of the hill. And this effect will be rendered more certain by the flowing of the water up the bays at the mouths of the rivulets which descend from the high lands. This reasoning is supported by the fact, that in all the excavation that has been done in the ravine, there has been little or no sand seen. The alluvion is almost entirely mud, which, when the ravine has been once excavated, can be carried off by exciting a current all the way from Wickham's bridge, which will rush through the large flood gates that are placed at the lower mouth, four feet below the bottom of the canal. And this can be done as often as occasion requires. And if this operation should be neglected, till at any time the mud deposited shall become in a little degree compact, it is believed that an iron drag attached to the stern of a boat, and dragged along while the current is flowing, will produce the desired effect. And here let it be remarked, that the water in this portion of the canal is entirely under control, by means of the guard-locks at Wickham's bridge, and the fish-pond, and the guard-gate at the middle mouth. It may be drawn off entirely, or admitted in whatever quantity is desired, to the surface of the water above the upper guard-lock at Wickham's bridge, so as to scour the channel, without danger to those natural banks which time has formed into too solid a mass to be injured by any current that may be necessary to effect this object. In short, it is not hazarding too much to say, that this 4 miles and 43 chains can be kept clean at much less expense than the same distance in any other part of the canal, from the basin to Pleasants's Island. Another objection to the abandonment of this portion of the principal line is, that this long sheet of water, from the fork of the middle mouth to the western mouth, 4 miles and 20 chains, would become stagnant, and produce a deleterious effect upon the health of the neighbors.

But, the most important objection, so far as it regards the navigation, is not yet touched. The expectations of that enlightened body of [illegible] York, who have furnished light for our path, [illegible] disappointed in the distance to which a full supp[illegible] feeder will sustain their navigation. The information derived from general Cocke's letter, hereto annexed, is conclusive upon this subject, and shows that from 15 to 18 miles is as far as they can depend upon a feeder. Would it not be bad policy, after building a dam over James river, to supply 7 miles 53 chains of canal with water, to cut off 4 miles 43 chains of it, and add so much to the next line, particularly when there is too much reason to apprehend that a dam cannot be located at Pleasants's Island, without the most manifest danger of very great injury to the lands, and health, of that neighborhood, (in this opinion, every engineer who has seen the site since it was designated by Moore and Briggs, as well as your commissioner, agree,) and when it is considered too, that a lateral canal up Tuckahoe creek, which there is every reason to believe will, at a future day, be constructed, must be supplied with water from the feeder up James river? This is five and a half miles.

The distance from Wickham's bridge to Maiden's Adventure falls, is nearly 16 miles. We must keep in view, also, that the nearer we are to the great mart, for the commerce that is to be carried on through the whole line to the Kanawha, the more the locks will be used, and the greater will be the draft upon the supply, and consequently the shorter the distance to which we can rely on a feeder. And even if, in the present state of our trade, it thould prove sufficient, may we not anticipate the period, when our bright prospects of increased commerce may be realized, and our demand for water will be proportionably increased? It is true, that we have reason to believe the clay through which our canal passes, is more retentive than that in New York; and, consequently, the absorption here will not be as great as there. But it is equally true, that we have more to dread from evaporation than they. It would then be unwise to speculate upon the advantage we have over them on the one hand, and the disadvantage we labor under on the other, when there seems to be no necessity for it.

A permanent dam might have answered the purpose, for the principal line of the canal, instead of the guard lock at Wickham's bridge; and if there had not been a considerable deal of labor performed, in the excavation of the lock pit, and in putting down the timber and laying down the floor, as well as a large mass of stone deposited there for the lock, we might have been induced to annul this contract, and pay damages, as in the case of Dalton's lock, to remove it to the fish pond. But, unwilling as we were to undo more than was manifestly proper in our opinion; and seeing that by going on with it, and clearing out the upper mouth, we should furnish more complete accommodation to the coal, and other trade from the south side of the river, by bringing it sooner under protection, and giving it 4½ miles more of towing path than it it would have by floating down to the mouth; and seeing too, that we should endanger the health of the neighbors less than by rendering stagnant the water in the creek, for a mile and a half, we determined to let it go on to its completion, under the contract made by the James River company, with Thomas B. Conway, and thus have a living stream flowing through the whole channel of the creek, and the ravine. The entrance at the middle mouth is guarded by a guard-gate, instead of a guard-lock, as was contemplated, because it is much cheaper, and so near the dam that the river will seldom rise high enough to produce such a pressure as to prevent its being opened; and, if necessary, the water can be raised as high within as it is without, and not endanger the natural banks of the ravine. A guard lock was placed at Ferguson's fish-pond, as a protection to the artificial banks, in Ferguson's and Shepherd's farms, in case at any time by a fresh in the river, the water should find its way across the Tuckahoe island, into the ravine, when it might not be sufficiently high to invade them from below the dam. And here too a guard-gate might have answered the purpose, except at particular times, when it could not be opened, and the passage of boats in the principal line might be arrested: an inconvenience, which we wish to guard against at all times, except when there is a considerable fresh, and then it cannot be avoided.

As to the comparative expense of the two plans, the commissioner has seen no estimate of the expense of continuing the high level through the farms of Messrs. Wickham, Curry, Wickham again, Ambler, and a part of Ferguson's. For himself, he has thought the reasons for declining to adopt it, sufficient, without making the estimate. From the view, however, which he has taken of the ground to be excavated, and the culverts which would be required, he is under the belief, that it would very far exceed the cost of the low level.

Our next object was to locate the line to Pleasants's island, in that way which would be most conducive to the advantage of the navigation, having a due regard to the expense which would be encountered. It would have been very desirable to pursue one level through the whole distance, but the same level which required high embankments in various parts of the lower portion of the section, particularly in captain Randolph's farm, where, in consequence of [illegible] rocky hill sides, the canal must be located at the [illegible] and the embankments raised to the proper height, would occasion deep cutting in the upper portion, particularly in the upper part of Dr. Trent's farm, and the governor's. We, therefore, determined to rise 23 feet 3 inches, by three locks, beginning immediately below our grand lock, which enabled us to leave a safe passage for Tuckahoe creek, under an aqueduct, and at the same time afforded a convenient and economical location for the laternal canal, 5½ miles up Tuckahoe creek, to accommodate the coal trade in that district, as well as to the principal line up the river. We pursued this level till it was thought advisable to lock up in Sampson's farm. We there took a level four feet higher, which enabled us to pass Dover creek and Jenito, by aqueducts. This carried us to the site designated by Moore and Briggs, one foot higher than their bench mark. Upon trying the level as well on the north side of the river, in the farms of Messrs. James Pleasants the governor, Isaac W. Pleasants, and Wm. Henry Pleasants, as on the south side in the Maiden's Adventure farm, owned by Mr. John Gilliam, we found that the injury to these farms and to the health of the neigbors, would be too great to be justified, if any other plan could be devised. A considerable portion of the broad and fertile low ground at Maiden's Adventure would be covered with water from the bare surface of the dam, according to Moore & Briggs' bench mark, without making allowance for the thickness of the sheet of water on it, and the gradual ascent which it would assume on every rise of the river, at the distance of from one to two miles above. Indeed no dam which would furnish a tolerable safe canal could be erected there, without producing heavy condemnations for land, and serious mischief to the health of the neighborhood.. By extending the section three miles fifteen chains farther, all private damages will be avoided. At the Maiden's Adventure falls, a much lower dam will be sufficient to divert the water of the river into the canal, while the lands opposite and above it, are sufficiently high to be out of the way of any damage whatever. It will be erected upon a fine ledge of rocks, extending entirely across the river, and at the same time that the canal will be under the protection of the river bank, which is in no place less than 18 feet high for upwards of two miles down, near the mouth of Beaver Dam creek, it will be located in the lowest part of the low ground, where the cutting will not average seven feet in depth. Indeed, it possesses advantages which will rarely be met with on the river.

In the mean time, having fixed upon a period for drawing the water out of the old canal, when it was supposed the least injury would be done to the community, by suspending the navigation; when the health of the people in Richmond, and those engaged in the work, would be least exposed to danger, by the mud in the canal, and stagnant water in the basin; and when the millers, who had a legal claim to the use of the water, could best dispense with it; and having made an agreement to furnish a more liberal supply in time to manufacture the crop of wheat, as a compensation for the period during which they would be deprived of it, the labour of boating dirt, and strengthening the banks removed by the James river company for the purpose of giving greater width to the canal; blasting down the promontory of rock opposite to Rutherfoord's and Chevallie's mills, and all other blasting which would be done before the water was drawn off; boating rock, and building walls to support the highest parts of the new embankments; and depositing rock for building walls within the canal near the basin, when ground was too scarce to give the proper width by slopes; and all other preparatory labour was performed: These operations were carried on under the direction of the superintendent and as many overseers as were competent to the management of 150 hands; this number was increased to 200, when the water was drawn out on the 15th of May, according to notice in the Enquirer; at the same time that 80 to 90 hands were employed by John P. Shields to accomplish his contract with the James river company, for the section above the mills. A sufficient force was at the same time engaged, to build a dam in the channel where the water was discharged into the river at the old locks, to convert these lift-locks into a guard-lock, by raising the walls of the upper chamber, with the stone which formed the lower one; and to take all other measures to divert the channel into that portion of the new canal, which was constructed by Briggs and Gamble, under their contract with the James river company; so that this new canal was filled, and the water returned into the old one, on the 17th day of June. Since that time, a great deal was done in finishing the walls, which were raised to the intended surface of the water in the old canal, while it was out; raising, widening, strengthening, and levelling the bank, and forming the tow path.

It was to be expected, under all the circumstances, that breaches would occur in these newly made and very high embankments. The James river company determined, (and in the opinion of the commissioner very properly,) that the expense of blasting down the clifts of rock on the north side of the canal, was too great to be encountered, particularly as it must occasion incalculable delay to the navigation. They therefore adopted the plan of removing the bank on the south side, to obtain the increase of width and depth which was required for the large boats, which it is in contemplation to use. In doing so, the bank was necessarily located on the loose rock and rubbish which was laid below, and out of the way of the canal on its original construction. Time had formed that and the earth which was mixed with it into a compact mass. They removed it to the depth of two feet below the bottom of the canal, and puddled it up to the bottom. Nevertheless, after the water was let in, it found its way through some weak and hollow places, and caused breaches in the bank. They were few in number, and as soon as they occurred, a bay dam was thrown round, and but little delay occasioned to the trade, which was carried on while we were repairing them. There is no instance of their giving way where they have been repaired, and there is every reason to hope that they are now strong and permanent.

It was deemed all important to rid off this burthensome job in the old canal, which had always been a clog upon the new one, in order to finish at one end, while we were extending our operations at the other. For the same reason, as well as for the purpose of obtaining, as soon as possible, the additional toll on coal, a vigorous effort was made to bring the next line to Tuckahoe into use this winter. To that end, the most intelligent and energetic contractor that could be selected, Mr. John Bosher, was employed at the earliest possible moment, to build the dam across the river, which was a key to the whole business. In the belief that it would be in such a state of forwardness, that the navigation of the river would be stopped, before the canal would be ready to receive the water, a lock was contracted for in one of the abutments, to be built of the best wood, viz: white oak, post oak, and heart pine, and the walls backed and filled with stone. Unfortunately, however, in consequence of the contract being made at so late a period of the year, before the great mass of materials could be procured, and deposited at the site, a favorable portion of the season for laying it down was lost; and during the rest, the water kept up higher than it has been known to do for many years. The laborers became unusually sickly, and in spite of all the most spirited exertions of this diligent contractor, who was near losing his own life, by his unremitted endeavors to comply with his engagement, our hopes have been disappointed, and a great proportion of the work on the dam remains yet to be done. Whilst on the subject of a lock in the dam, the commissioner will take occasion to remark, that he can devise no plan, by which the trade can go on whilst the work is drawing to a close, except by a lock of some description, or by landing the cargo above, carrying it round, and re-shipping it in a boat below. This would be very inconvenient, besides subjecting the owner to considerable loss by changing the carrier. The period of time during which the navigation would be stopped, must be very uncertain. As the channel becomes reduced in breadth, the velocity of the current is increased, and being studded with rocks, in all places which are eligible for the erection of dams, it is plain that before the work can be near to its completion, the ordinary force required to man a boat, could not descend with safety, and would be altogether unable to ascend, particularly in moderate rises of the river. And when the water is let into the canal, prudence will require that it shall be admitted in a small quantity, and the volume gradually increased, till the embankments and all the other works are sufficiently tested, before the boats are allowed to pass. On the other hand, a lock will secure a safe and easy passage, the dam can be taken entirely across the river, by carrying its whole length gradually to the intended height, and the water will spread in a thin sheet over various parts that can be left open, and closed as the work progresses.

The whole line of canal to Tuckahoe, was laid under contract as fast as contractors could be obtained, and the work progressed as rapidly as could be expected, until the sickly season drove many of the laborers from it, and it was impracticable to supply their places. It is, however, in a state of great forwardness, and will be ready as early as the dam can be finished in the next season.

The next section from Wickham's bridge to Pleasants' island, was also let to contract as fast as we could get contractors, who could obtain hands. The contracts are all taken to Jenito, and a considerable proportion of the work is done.

Notwithstanding the confidence that is entertained in the propriety of extending this section to the Maiden's Adventure falls, the commissioner feels much delicacy in carrying on his operations beyond the point to which he is limited by the act of the Legislature: Nevertheless, as it is nothing more than an extension of the section to a more eligible point for receiving the water, he will take the liberty to exercise a discretion, which he infers that he is clothed with, unless it shall be the pleasure of the Legislature to instruct him to the contrary. He is induced to do this, because of the evil which has resulted, from the lateness of the period when the dam was contracted for last spring. If an opportunity should offer, he thinks it desirable that the next one should be put under contract without delay. There will be also some dry walli that portion which can be carried on in the winter, when other work cannot.

The want of efficient contractors, as well as common laborers, has retarded the operations very much during the last season; this has been in some degree owing to the law of the last session having been enacted at so late a period, that the time for hiring laborers by the year had passed. Frequent propositions have been made by contractors from New York, but none have taken contracts till lately. One has taken an aqueduct over Tuckahoe, and another a stone wall and excavation above. If it should be the pleasure of the Legislature to act upon this subject, at an early period of the session, there is little doubt that others will come forward in the ensuing season, as their work is drawing to a conclusion.

The annexed statements show the amount of money which has been paid on each contract; there is a further sum due on each one that is unfinished, which is retained to ensure its accomplishment. The estimates of what is to be done, show what it is supposed will be wanting to finish the canal to Maiden's Adventure falls. Each section is charged with its own amount. It is a subject of much concern, that they should so far exceed the estimates of the engineers, by whom the work was recommended to the patronage of the Legislature. When we consider, however, the great extent of their survey, and the short time in which it was performed, we must at once perceive that they did not allow themselves time to make such estimates of what was to be done, as could at all times be relied on for accuracy. It must have been a superficial view, that induced the opinion that the old canal could be widened and deepened for $ 3,750, a sum far short of a sufficiency to feed the laborers who have done the work; or, that a dam could be built at Pleasants's island for $ 4,000. It will be seen, too, by reference to their report, that there is no estimate for a culvert or aqueduct, in the whole line to Pleasants's island, except at Tuckahoe creek, where an embankment, or aqueduct, as may be thought best, is recommended, and estimated at $ 1,200. The sum estimated for a connexion with the river to raise the coal, and other trade from the south side of the river into the canal, is only $ 10,000. This defect was happily remedied by the James River company, when they adopted the section to Tuckahoe, for the purpose of accommodating that trade. But for this, the only means of bringing it into the canal, would have been by locking it up from
river; in which case, every lockful of water, and the l
is more or less incident to all locks, would h
d a deficiency of water the probable conseque

is to be observed, too, that the estimates were made for a canal 36 feet wide at top-water line, as far up as Graham's farm, for the accommodation of the large coal boats, and 30 feet above that point, and 3 feet deep: whereas, the canal is now made 3½ feet deep and forty wide throughout; it being considered bad policy to conduct the water, part of the way, in a narrow canal, and empty it into a wider one for the remaining part, without any additional supply, and thereby increase its breadth at the risk of diminishing its depth.

No estimate is made for the condemnation of land, and the destruction of Wickham's mill, on Tuckahoe, Watkins's on Dover, and Woodson's on Jenito; all of which must have been paid for, or the streams must be passed under aqueducts. If they had been acquainted with the character of these streams, which would afford very little aid in dry seasons, and in wet ones would endanger the work by the prodigious torrents which they convey, it is probable they would have thought it better to encounter the expense of aqueducts, rather than the risk of taking them in, setting aside even the cost of the mills. In like manner, if they had been aware of the quantity of sand and mud, which must be received from the smaller streams and drains, culverts would probably have been thought necessary to pass them under, and in some instances parallel ditches to conduct the washings of the hills into them. Indeed, such is our conviction of their importance, that where we have not room to turn stone arches, we have resorted to the expedient of iron castings. This plan of passing the streams by aqueducts and culverts, will add much to the expense of the canal in the beginning, but in the end will save a great deal in the cost of cleaning out, as well as in the delay to the navigation whilst the operation is going on. The excavation of earth has been done as low as, and in some cases lower than, the estimates; but the quantity of it far exceeds them, as well because the canal is wider, as because the cutting is deeper than it is reported. The excavation of rock is, in some places, vastly higher. For example, the expense of walling and excavating round the first point of rocks above the upper arch, is estimated at $ 1,504: we have contracted for it with three men, two of whom are excellent stone masons, at $ 9,500, and we have reason to believe they will have but little profit, although they have prosecuted their labours with as much diligence and judgment as any contractors we have employed. The next po [illegible] f rocks above, is estimated at $ 1,08 [illegible] employed tw [illegible] en upon it, one of whom is an excel [illegible] mason; the [illegible] ve exercised as much diligence [illegible] as tho[illegible] entioned, and the work cannot be completed for the sum contracted for, which was $ 7,000. Another, and a very important item, was not originally estimated, viz. the fencing on both sides of the canal, the expense of which, the last act of Assembly makes it the duty of the commissioner to encounter. It will be readily perceived, it is presumed, that all these items added together, will constitute the difference between the original estimate and the sum actually required to complete the work. We have endeavoured to have it executed in a durable, and consequently a costly manner, under the belief that it is not advisable to temporise with a work of this magnitude, where so much might be lost by the delay incident to frequent repairs.

The commissioner has thought it a duty he owed to himself, as well as the Legislature, to trouble them with a more full and explicit detail of his operations, than would otherwise have been necessary, in consequence of his deviations from the course laid down by Moore and Briggs, to which he is directed by the law to conform " as nearly as may be."

The statements show, that there has been expended by the commissioner on the canal between the old locks and the mouth of Tuckahoe,	$ 66,649 87
There was also expended by the James River company, on the same portion,	22,000 00
There will be wanting to finish this portion,	40,808 00
Making an aggregate sum for the cost of 9 miles, 56 chains of canal, of	$ 129,457 87
Which amounts to an average sum per mile, of	13,350 00

It will be observed, however, that only 7 miles 53 chains of this belongs to the principal line of the canal; the remaining 1 mile 43 chains of the creek, being cleared out for the purpose of giving greater accommodation to the coal, and other trade, on the south side of the river. It must be remarked on the other hand, that this short portion is taxed with an expensive dam, where the river is 1100 feet wide; and with two guard-locks. There is also a small sum included for finishing the old canal.

There has been expended between Wickham's bridge and Pleasants's Island,	48,543 41
There will be wanting to finish the canal to Maiden's Adventure falls,	201,927 00
Making an aggregate for completing 15 miles 36¼ chains, amounting to	$250,470 41
An average per mile, of	16,200 00

Unenlightened as the commissioner was upon the subject of the important work committed to his management, he gladly availed himself of the opportunity afforded by general John H. Cocke, who, impelled by a patriotic zeal for the success of our scheme of internal improvement upon the James and Jackson's river, made an expedition to New York, during the last summer, and explored the grand canal from Albany to Lake Erie, and kindly offered to direct his attention to any subject of enquiry which might be suggested. He accordingly addressed a letter to the general, a short time before his departure, which is annexed, marked C., and received his answers, also annexed, marked D. and E. The very valuable information they contain, is with great pleasure communicated. They will supersede the occasion of such general remarks upon the subject of our canal, as it would have been the duty, and the inclination of the commissioner to make. He cannot, however, refrain from offering his most sincere congratulations to the Legislature upon the important datum, contained in the communication marked C., that the estimate assumed by Mr. Fulton will be realized; viz. that transportation will be effected for one cent a ton per mile, as soon as the canals are in full operation. Such an opinion, coming from such a source, is worth volumes of argument. It is founded, "not upon the arguments of the advocates of the New York canal, but upon facts which he has witnessed, at every step of his progress." If this estimate should be realized, it will require very little calculation to show that very great expenditures of money will be justified for the attainment of such an object.

Most respectfully, your obedient servant,

RANDOLPH HARRISON,
C. J. & J. R. C.

December 4*th*, 1823.

[A.]

To **Randolph Harrison**, Esq.

Commissioner for the James and Jackson's River Canal.

Sir,

I must preface this communication by stating, that the plan of the canal now making between the city of Richmond, and the county of Goochland, was not advised by me. It was adopted before I was appointed the engineer of the James River company; and on entering upon the duties of my office, I was directed to carry it into execution. My disapprobation of some of its prominent features, was made known to the directors on many occasions verbally, as well as in written communications, dated 20th July and 4th August, 1821, 28th March, 1822, and in a remonstrance on file, in the office of the company, the date of which I have forgotten. At various times, I suggested alterations in some of the details of the plan, some of which were adopted and others rejected. These, however, were by me deemed no more than palliatives, and not calculated to remove the chief objections.

The plan adopted, contemplated the conversion of the channel of Tuckahoe creek, from its western mouth, to a point in the eastern branch, near Ferguson's fish pond, into a canal: the water to be supplied from the river through the western and middle mouths of the creek, by the erection of a dam across the river, about a quarter of a mile below the middle mouth. The river freshets were to be excluded by guard-locks, to be erected in the western and middle mouths of the creek, and by embankments at such low places along the margin of the river, as would otherwise afford an inlet to the water.

This plan made no provision for the freshets of Tuckahoe creek itself, although it sometimes has a flood equal to a volume forty feet wide, and ten feet deep. If it were possible to build a guard-lock in the western mouth, strong enough to withstand such a freshet, the water would inevitably have opened another channel for itself, through some other part of the low grounds. In consequence of my suggesting these inconveniences, the plan was changed so as to locate the western guard-lock, in the western end of the *eastern* branch; thereby affording an opportunity for the creek to vent its waters through the *western* branch. The eastern channel of the creek, nearly four miles in length, was, however, still to be converted into a canal, by excavating its bed to the requisite depth. A contract for that purpose was made with William Hetherton, at a rate so very low, that he has been unable to accomplish it; and it will cost $ 3,000 more, to complete the excavation.

While it was contemplated to protect the proposed canal from the river freshets, in the lands of Messrs. Wickham, Currie and Ambler, it was not deemed necessary to extend a similar protection in the farm of Mr. Ferguson; although the late freshets have shewn that the water can find an inlet, not only through the eastern mouth of the creek in his land, but also over the river banks, which, for a considerable distance, are much lower than in the other farms. A protection in this quarter will require a very expensive guard-gate, and more embankment than in all the other farms.

Any works which would serve to exclude the waters of such a freshet, as was lately experienced, must cost a very great sum of money. While that freshet continued, the low grounds were covered to the depth of several feet, and the site of Tuckahoe creek could not be distinguished. Had the canal, as proposed, been completed, its navigation must have been suspended; and for some days after the subsidence of the water, the towing path would have been incapable of use. In another part of this communication, I will have to remark, how such interruptions in the navigation will operate as a tax upon those who are dependent upon its use.

But I object to the adoption of Tuckahoe creek as a part of the main canal: because, if there never was a river freshet, the canal would soon cease to be navigable. Throughout its whole extent, (about four miles), the eastern branch of Tuckahoe is the necessary receptacle of all the alluvion from the low grounds on the south, and from the hills on the north side, as well as of all the streams and rivulets within that space. For this whole distance the land on both sides is cleared, and in a state of cultivation. There is no possibility of passing any of these streams under the creek by culverts; and the inevitable result must be, that in a very short time it will be filled with bars of sand and other deposit, so as to impede the navigation.

Upon every view of the subject, I am decidedly of opinion, that it is necessary to abandon so much of the present plan as contemplates converting the eastern branch of Tuckahoe, into a part of the main line of canal. That portion of it lying between Ferguson's fish pond, and the middle mouth, I would use as a feeder, and as an inlet for the coal and other boats, from Chesterfield and the lower part of Powhatan. The erection of a guard-gate, either at the east or the west end of the fish pond, will exclude freshets from the canal east of such gate; and it will be easy to raise the towing path in Ferguson's and Shapard's farms, out of the reach of the inundation.

As a *navigable* feeder, that portion of the eastern branch proposed to be used, will still be liable to interruptions from freshets, and to impediments from deposit of sand, &c. These interruptions, however, will only be experienced by the boats from the other side of the river, which could not in any event enter the canal during a fresh, and the sand bars being fewer, could the more readily be removed. No interruption upon the main line of canal would be experienced.

As a consequence of the adoption of the plan now recommended, the two guard-locks designed to be built; the completion of the excavation of Tuckahoe creek; and all the embankments necessary to guard against freshets, may be dispensed with. The money thus saved, will more than defray the expense of an independent canal from the Goochland line, along a higher level, to Ferguson's fish-pond. This independent canal will be obnoxious to none of the objections urged against Tuckahoe creek. Culverts for the passage of the several temporary, as well as permanent streams under it, can easily be constructed. This is the original plan recommended by Messrs. Moore and Briggs, and departed from, without due reflection.

The next subject to which I would call your attention, is the alteration in the original plan of Messrs. Moore and Briggs, by locking into the river at Ball's Sluice. This scheme was always a favorite one with some of the board of directors, and is still justified as a measure of expediency, and of economy. That it is opposed by both of these considerations, is I think, most apparent. It has however been adopted against the advice of every engineer who was consulted, and I venture to affirm that it will be approved by no one entitled to the name.

The plan now executing, instead of a continued canal navigation, contemplates locking into the river, about 50 chains above the upper arch, and using the river for that distance. The adoption of this plan, sets at naught all the experience of the old and new world, and is equally regardless of the opinions of every writer upon the subject of inland navigation. All unite in reprobating every attempt at combining a river and canal navigation, where it can be avoided.

Between the proposed lock and the upper arch, it is proposed to form a towing path along the margin of the river. This, if made so high as to over-top the water during freshets, will be very inconvenient for use in low water; and if made to suit the navigation in low water, will require considerable expense in its construction, or it will be always liable to great injury during high water. For, this being a concave shore, it receives the full force of the current throughout its whole extent. The rapidity of that current may be conjectured from the fact, that during the late freshet, the water at the site of the locks was ten feet higher than the ordinary surface of the river, while upon the dam, only 50 chains below, it stood only three feet, thus shewing a fall of seven feet in that distance. The *sites of both of the proposed locks at Ball's Sluice, were covered by the freshet.*

During high water, the ascending navigation will be interrupted by the rapidity of the current; and the descending navigation will be equally stopped, by the danger of attempting to pass around the convex wall, just above the arch, and entering a narrow passage of only 16 feet width, within twenty feet of the pitch of the dam.

The inconvenience and delay which will be occasioned by freshets, are of themselves sufficient reasons for avoiding a communication with the river where it is now proposed. The delay alone operates as a heavy tax upon that part of the community dependent upon this navigation, whether as carriers, or growers of produce. The number of boats which now annually descend the river, exceed 8,000, or about 22 per day. The daily charges of boatmen's wages, provisions, &c., and wear and tear, &c. cannot be less than three dollars per day for each boat. If, therefore, the interruptions to the navigation should altogether amount to only ten days in the year, 220 boats going each way would be detained; and the aggregate number of days would be 2,420, which at $ 3, gives, as the cost of detention, the sum of $ 7,260. I have frequently known 100 boats collected above the arch by a detention, in consequence of a freshet of only two days. The above sum is the interest upon $ 121,000, more than five times the cost of an independent canal, which would avoid every inconvenience. I therefore feel no hesitation in advising, that the further operations of Mr. Dalton be stopped, and a new contract made with him for the erection of locks below the arch, so as to communicate with the old canal. Also, that measures be taken to continue an independent canal to the same point. If I am confident of being right in any thing, it is in the belief that a perseverance in the present plan will hereafter be a subject of deep regret, as well as of reproach. And I hesitate not in saying, that this scheme met with the general reprobation of the members of the late Assembly.

If there is any force in the observations here made upon this subject, the reasons adduced by the president and directors of the James River company, in apology for this plan, cannot be deemed satisfactory. But, there is one idea suggested by them, in response to a resolution of the House of Delegates, so extraordinary, that I must not pass it without notice. They remark, that at a future day, if necessary, it will be easy to convert this part of the river into a close canal, by forming an embankment parallel to the shore, in the bed of the river, of such a height as to exclude the current. Let it be recollected, that for about 40 chains in length, the river is very deep; in some places twenty feet; and that, as the freshets rise ten feet above the ordinary surface of the water, the proposed embankment must also be raised *at least* as high. If the medium depth of water is only ten feet, the embankment must be twenty feet high. I will not say, that upon this concave shore a bank cannot be formed, which will be indestructible by the freshets; but its cost will greatly exceed that of an independent canal. The embankment must be formed by casting the materials of which it is to be composed into deep water; and the least reflection will shew, that its sides will assume a very gentle slope, say at least three feet base for each foot in height. If the bank finishes six feet wide at top, each chain in length will contain 3,226 cubic yards; and at 20 cents per yard, will cost $ 645 per chain, or $ 32,250 for the whole embankment. The suggestion was made without reflection.

When I began to write this report, it was under the belief that I was still the engineer, upon whom would devolve the responsibility of suggesting the proper mode of executing the work committed to your direction. Our conversation this morning has undeceived me on this point; and I might stand excused, if I now refrained from troubling you with my sentiments: but I feel so deep a solicitude for the success of the James river canal, that I cannot silently, see a perseverance in plans which I believe will do essential injury to a great and valuable public work.

Assured that you will not misunderstand my motives in making this free communication, I subscribe myself

Your friend and servant,

JOHN G. GAMBLE.

Richmond, March 12, 1823.

[C.]

CLIFTON, 8th May, 1823.

MY DEAR SIR,

I learn, with great pleasure, that your contemplated trip to the New-York canal is matured, and about to be put in execution. When I saw you last, you were so good as to request that I would suggest for your examination, any subjects which might occur, in the course of my reflections, most important to the success of our enterprise on the James and Jackson's river. I consider it a settled point, that our supply of water to feed the canal must come principally from the river. The lateral streams, so far as I am acquainted with them, cannot generally be relied on during the summer and fall months; at the same time that in heavy falls of rain they bring down such torrents of water, that unless we provide very extensive wastes, our banks will be more endangered from them, than from the river itself; because, in every case where we receive a feeder from the river, a guard lock will be placed at such point as affords the best prospect of defence. In addition to this, the canal will be liable to fill with the sand and mud brought down by these lateral streams. I would, therefore, generally prefer to pass over them by aqueducts, where there is sufficient elevation to accomplish it with safety. It follows, then, that the most important subject of enquiry is, how far a feeder from the river will sustain our navigation, before its volume will be so diminished by absorption and evaporation, as to be sensibly felt, and how this diminution will be affected by the different kinds of clay or soil through which it may have to pass.

I have been informed, that a loss of three eighths of its depth was experienced in a body that travelled 20 miles in the canal on the Mohawk. This, however, was probably before the earth had become saturated and compact. Their experience now upon the subject, may, I suppose, be relied on, and by making allowance for the greater heat of our climate, may furnish something like authentic data for our guide.

It appears to me, that the most critical and extensive information upon this subject, under every variety of circumstances, will be more useful to us than any other. The next point in importance is, to learn from their experience what effect is produced upon their banks by abrasion or abruption in time of freshes. I am inclined to hope and believe, that the principal inconvenience arising from them, is the unavoidable delay to the navigation. For, I have always observed, that when the low grounds are inundated, there is little or no current at the foot of the hills, except where there is a promontory extending to the water edge, in which case it is generally rocky and the canal will be formed by a wall of stone. If this reasoning be correct, it will be a subject of much less regret, that we should have occasion to go to the river for feeders: because, they will afford, perhaps, the cheapest, and certainly the most perfect accommodation to the trade on the opposite side of the river; at the same time that it is received without any loss of water, which must necessarily occur in all cases where we lock down to the river to receive it. I would also call your attention to the use of iron aqueducts, which I understand are apt to burst in the northern climates, in consequence of the excessive degree of cold; perhaps they might be more safely used here, particularly by adding something to the thickness of the castings. You will perceive this subject to be connected, in a very important degree, with the plan of passing over the lateral streams by aqueducts, which can in many cases be effected by iron, where there will not be elevation enough to turn stone arches; and even wooden ones, which I consider a poor substitute, would require much more room than iron. All other subjects of investigation I consider of minor importance to them. It will be very useful, however, to examine their manner of constructing locks, and particularly the most approved method of filling them, the prices at which they are built, and of all other kinds of labour connected with the subject of canals. Indeed, my dear sir, I am only induced by your friendly invitation, to call your attention to any objects of enquiry upon a subject which I know has occupied your mind very much; particularly when I recollect that upon seeing the work, numberless sources of information will present themselves, which do not occur to me. I have only, therefore, to assure you, that I shall be indebted to you for any instruction relating to my duty as commissioner, and that I know it will give you pleasure to afford it.

Accept my earnest wishes for your health and happiness during your absence, and believe me always

Your cordial friend,

RANDOLPH HARRISON.

General JOHN H. COCKE.

[D.]

UTICA, June 17, 1823.

My Dear Friend,

Upon reaching Schenectady three days ago, I had the good fortune there to fall in with Judge Wright, the principal engineer of the Erie canal, just coming up along the line of the works to the Little Falls. Upon presenting the letter which Mr. Robinson forwarded me, through you, we soon became acquainted, and I at once secured the advantages of accompanying him through the whole course of the canal along the valley of the Mohawk from Schenectady to the Little Falls, a distance of 58 miles, at the interesting moment when they are filling a great part of this section with water for the first time, with the recent experience of a partial filling of another part last fall. I have found Judge Wright one of the most strong-minded, intelligent, self-taught men I ever met with; and altogether as willing, as he is able, to impart the information I was in quest of. A letter will not admit of communicating a thousand valuable details, which I shall endeavor, by memoranda, to keep myself in possession of; and I will, therefore, come at once to the all-important point of a supply of water.

At the Little Falls, they take a feeder from the river, which has hitherto been the only unfailing dependence to Schoharie creek, a distance of thirty-six miles; in the course of which, although there are several tributary streams, they are all subject to fail in the time of need. This supply is found to be so inadequate, that it has been decided to erect a dam across the river at a convenient intermediate point. The contract is made, and the execution of it is limited to the shortest possible time. And Judge Wright returned yesterday evening from the Little Falls to fix the spot between two or three points, said to have nearly equal advantages.

This new resource, it is expected, will be sufficient to ensure an ample supply down to the Schoharie creek. This is the boldest water-course which empties into the canal between Schenectady and the Little Falls, and comes in at the distance of 21 or 22 miles above Schenectady, and is mainly relied upon for a supply of water down to a feeder, to be taken from the river 5 miles below Schenectady. The Schoharie is now full, and wastes a large quantity [illegible] over the dam which has been erected to raise its [illegible] level of the canal: and yet, Judge Wright is [illegible] it will be found sufficient for the 27 miles, with several smaller aids, and therefore thinks it highly probable, they will have to take another feeder from the river in this section. Between the last named feeder within 5 miles of Schenectady, and the termination of the canal at Albany, a distance of 24 miles, they are preparing to take two feeders from the river; and Judge Wright seems to be entirely of opinion that there can be no safe reliance upon any other source. He is altogether opposed to reservoirs, and says the failure to which the tributary streams are liable in time of drought ought to make them a suspicious dependence.

This will be sufficient to set you wide awake, upon a subject on which you were already so fully impressed with the necessity of vigilance; and for further details, you must wait until I get back, although I am full, almost to bursting. Had I time, it would be impossible for me to give any adequate idea of the impressions I have received of the advantages of this magnificent scheme of internal improvement; not derived from the arguments of its advocates, but from facts which I have witnessed at every step of my progress, since I met the navigable water.

For one, take this. I have just taken our passage in a packet boat, with as elegant accommodations as you find in our steam boats, for Rochester, 160 miles ahead, which we shall reach in 48 hours from this time; and the whole cost of living and transportation, is $ 6 25, for each passenger; and from unquestionable information, I am induced to conclude the estimate assumed by Fulton, will be realized, to wit: that transportation will be effected for one cent a ton per mile, as soon as the canals are in full operation.

The time has arrived for our departure, and I must conclude.

God bless you and yours,

JOHN H. COCKE.

From Albany to Schenectady, distance 29 miles, fall 225 feet; Schenectady to Schoharie, 22 miles, fall 3 feet per mile average; Schoharie to Little Falls 36 miles, fall 2 feet exclusive of the rapids; Little Falls to Utica, 22 miles distance, 1.6 feet fall; Utica to Rome, 15 miles distance, fall 1 foot.

[E.]

BREMO, August, 1823.

MY DEAR SIR,

In answer to yours of the 8th May, I take pleasure in communicating the following information, obtained on my visit to the New York canal, upon the topicks to which you directed my attention.

First—"How far a feeder from the river will maintain our "navigation, before its volume will be so diminished by evaporation and absorption, as to be sensibly felt; and how "this diminution will be affected by the different kinds of "clay or soil through which it may have to pass?" That part of the valley of the Mohawk between the Little Falls and the first aqueduct below Schenectady, a distance of sixty-three miles, most resembling in situation and circumstances the ground, as far as comes within my knowledge, upon which it has been contemplated to execute the improved navigation of the James and Jackson's rivers, may most safely be taken, as affording results for our instruction: I shall, therefore, confine my remarks upon this head, to that section of the New York western canal.

It seems to have been originally supposed by the managers of this great work, that a feeder at the Little Falls, together with the aid of some intervening streams, would be sufficient to supply the canal down to Schoharie creek, a distance of thirty-six miles; and that the supply obtained from that water course, would carry the navigation twenty-seven miles further, to a feeder at the first aqueduct below Schenectady, making, in the whole, the sixty-three miles already mentioned.

But, in June last, the fallacy of this calculation, in relation to the first division, to wit, from Little Falls to Schoharie creek, had become so manifest, that it was determined by the board of commissioners to erect a dam across the river at a convenient point between the Little Falls and Schoharie, in order to furnish another feeder, in aid of that at the Little Falls, and the supplies of water derived from Canagoharie creek and other small tributaries upon this division of the work. And, accordingly, the work was contracted for, to be finished by the first of September. Thus, upon this section of 36 miles, there are two feeders taken from the river to be added to the supply furnished by the Canagoharie, one of the boldest creeks of the Mohawk, and other smaller tributaries.

In relation to the other division of 27 miles, it was originally supposed by the projectors of the work, that a dam 8 feet high across the mouth of the Schoharie, and at the point where the line of the canal passed it, raising its waters to a level with the water-line of the canal, and thus affording not only a full feeder to the navigation, but a considerable reservoir to maintain the supply, would be found sufficient for the 27 miles. This water course, in length and force, is fully equal to our Rivanna. This supply had been turned into the canal a few days before I left Schenectady, but it was filling so slowly as to excite the apprehensions of Mr. Wright, the principal engineer of the western canal, that it would be found insufficient for the purposes of the navigation; and, accordingly, the fertile mind of this Brindley of the west had already devised an expedient to meet the exigency. His plan was to supply the eventual deficiency by machinery like the Philadelphia water-works, where it is proven, by a happy combination of science and the arts, that a low head of any constant and sufficiently abundant stream, may be made to raise a large volume of its own body to a considerable elevation.

Thus, the experience of New York, in that division of the western canal between Little Falls and Schoharie, seems to fix the average length to which a feeder from the river will maintain the navigation at about fifteen miles, allowing the Canagoharie supply to be half equal to a feeder from the river; and estimating Mr. Wright's proposed additional supply to the Schenectady division of 27 miles, at one third of the demand, leaves eighteen miles to be supplied by the Schoharie creek and its reservoirs. So that it seems to be deducible, from the experience of New York, that a feeder of equal volume to the canal may be relied upon to maintain the navigation from fifteen to eighteen miles.

How the "diminution in the volume of water of a canal is affected by the different kinds of clay or soil through which it may have to pass," my observations on the New York canal do not enable me to speak confidently. There being great uniformity in the composition of the earth along the valley of the Mohawk, there were no opportunities afforded of making the comparison as to variety of soils, and to have drawn any general conclusions from the wastings of the new and unsettled embankments, would have been manifestly erroneous; especially, as experience on the first divisions of the work had hown that time and use continued to render the canal less d less subject to leakage. I found uniformly along the val- of the Mohawk, a larger proportion of sand than is to be und along the valley of James river, within my knowledge of the country, and hence I conclude the character of the earth along the valley of James river, will be found more favorable to a canal than that of the Mohawk.

Secondly—"To learn, from their experience, what effect is produced upon their banks by abrasion or abruption in time of freshes."

The recent construction of that section of the western canal along the ravine of the Mohawk, the only part subject to inundation, had not afforded much experience upon this point. There had been parts of the canal at different points, overflown with but inconsiderable and temporary injury. And I understood it to be the opinion of Mr. Wright, that he did not regard occasional inundations a serious cause of alarm, with the precautions which had been taken to guard against their injurious effects. And that this was the settled opinion of the canal commissioners also, was sufficiently manifest, from the location of the canal being at various points below the level, to which the inundations of the river have been known frequently to rise. For instance, I observed at the mouth of Schoharie creek, the top-water line of the canal, is within ten feet of the level of the river in its ordinary state; and at several other points, useless to be here designated, the difference of level between the water of the canal and river, was between eleven and twelve feet only. The precautions taken in the formation of all embankments, subject to be abraded by high water and rapid currents, is to give the bank a slope of not less than 45 degrees, and to protect the face of it, by a pavement of large stone, laid perpendicular to the face of the embankment, and varying in thickness according to the size of a stone from a foot to eighteen inches. For this, they pay 50 cents per cubic yard. The utmost confidence seemed to be placed in it as an effectual defence against all abrasure from the currents; nor did I discover in any of the numerous instances where the embankment of the canal had encroached upon the channel of the river, and of course was subject in all states of the river, to the chafing of the current upon some parts of its face, that there was any injury from it. I was informed by Mr. Wright, that these heavy sloping pavements had been found to resist more effectually the ice freshets so formidable in the Mohawk, than the strongest perpendicular or usual battered walls; of which, I saw a striking proof at the Little Falls. At this difficult pass, it became necessary to form the canal within the channel of the river by a wall running parallel with the perpendicular rocky barrier which here forms the southern boundary of the river, for the distance of half a mile. This wall, composed of very large stone, and laid with all the skill of the best workmanship, had yielded to the pressure of the puddling and volume of water within, and the assaults of the freshets upon its base without, until it threatened to fall, but was supported at various places, by large masses of loose stone, thrown into the river at its base, forming a foundation wide enough to maintain a sloping mass of the same materials to a level with the water of the canal. This was, in fact, resorting by a more expensive course, to the sloping bank and stone face, which subsequent experience has so strongly recommended.

Thirdly—"Iron aqueducts or culverts."

Mr. Wright thinks that cast iron culverts may be advantageously used in particular situations, provided they are not less than an inch in thickness. Where they have failed on the New York canal, he attributes it to the want of strength, being only half inch thick, rather than to the severity of their climate. In all cases, however, where there is sufficient elevation for culverts of masonry, he prefers them, observing to have the arches turned and grouted with water lime.

Fourthly—"Manner of constructing locks, and prices at which they are built; the most approved manner of filling them; prices of other labour connected with the subject of canals."

Their locks are universally of hewn stone, and, for the most part, lime-stone, that being preferred on account of its superior durability; occasionally, the sand or free stone has been used, and in some instances marble; but, every where, with the exception of a few of the first built locks on the middle section, they are executed in a masterly style of workmanship, and with stone of such large dimensions, that it is not uncommon, to see the external walls of a lock of 8 feet lift, composed only of eight courses.

I observed nothing materially different from ours in the construction of their locks, except that they use water lime throughout the whole structure, instead of confining it, as we do, to the outside joints; and that they use stone mitre sills in place of wood; but these are subject to scale and break by the concussion of heavy boats of forty-five and fifty tons; and must be protected by a beam of timber, called a bumping piece, so placed as to defend the mitre sills from the contact of the boats.

The price at which they have been built, is one thousand dollars per foot lift; where lime and free-stone has been used, the marble locks between Schenectady and Albany cost $ 1
per foot lift.

Some of the locks were built by the perch; but I found,
calculation, the result was not materially variant from $

a foot lift. The mode of filling and emptying the locks is universally the common one by culverts, formed in the body of the masonry, and paddle gates.

The wages of labour, when I was upon the New York canal, was every where twelve dollars a month; and the excavation of plain earth was readily undertaken at eight cents a cubic yard.

The embankment upon the level, above Schenectady, where it was necessary to raise the bottom line of the canal a few feet above the surface of the low grounds, was executed at twelve cents the cubic yard; but, in this case, the earth used is a regular deep, sandy loam, and all within reach of a convenient roll of the wheel-barrow.

The cost of excavating the argillaceous slate, between the aqueducts below Schenectady, varies from 37½ to 50 cents a yard, according to the quantity of the blasting requisite.

The solid lime-stone at Lockport, from $ 1 53 to 1 91; the Gennessee level, to wit: from Rochester to Lockport, an average of 15 cents the cubic yard.

Nine cubic yards, the average quantity of a day's work in plain excavation.

I was informed by Mr. Seamour, one of the canal commissioners, that $ 15,000 a mile would cover all the expense of that portion of the Western Canal between Schenectady and Utica, a space along the valley of the Mohawk of 80 miles, and including 200 feet of lockage. It appears by calculation, that 60,000 tons of produce, passing through this section annually, at a toll of a cent and a half a ton per mile, affords an interest of six per cent. upon the capital expended, and offers to us plausible data, by which to decide upon the practicability and advantage of our scheme.

It may be important to you, as the river commissioner, to know the reduced price at which the water lime of New York may probably now be obtained. Mr. Seamour informed me, he did not doubt, as soon as the canal was navigable to Albany, it could be afforded, at that place, at fourteen or fifteen cents a bushel.

I will trouble you with but one more statement. It is the fact, that the products of the soil in New York are now going to [illegible] by the means of their canals, at one cent a ton per mile[illegible] are paying six times that price for transportation [illegible] river.

Yours, truly,

JOHN H. COCKE.

[illegible], esq.

[illegible] *and Jackson rivers.*

[No. 1.]

AMOUNT OF EXPENDITURE,

DURING THE PRESENT SEASON,

Between the upper arch and the western mouth of Tuckahoe creek.

Names of Contractors.	*Am'ts paid.*	*Contracts.*
Jno. P. & M. W. Shields,	$ 1722 00	Widening and deepening a part of the old canal.
Conway & Staples, and Thos. B. Conway,	3250 00	Building a guard lock at Wickham's bridge.
James Lyons,	1240 90	Building culverts at Westham.
Jno. Dolton,	2478 32	Building locks at upper arch.
Briggs & Gamble,	700 00	Completing contracts with James River Company.
Ro. Bryson, senr.	926 25	Building wall on old canal.
James Hall,	61 60	Excavation of lock-pit.
Joshua Enos,	546 75	Excavation and embankment.
James Knox,	1900 00	Excavation and embankment, near the upper arch and on Ferguson's farm.
Ro. L. Staples,	964 75	Building wastes, and bridges and fencing.
Chiles Terrell,	150 00	Excavation and embbankment.
Js. Kennedy,	663 92	Making gates for old lock and upper arch.
Timms & Oliver,	570 00	Raising old lock.
Lancelot Woodward,	1063 48	Furnishing piles and timber.
Charles Kelly,	137 50	Excavating lock-pit.
R. Whitfield,	274 76	Furnishing plank.
J. Hitchcock,	142 76	Making wrought iron work of piling engines.
Carter & Lyons,	8250 00	Constructing part of the canal, and cut stone work of a lock.
John Bosher,	11500 00	Building dam and lock.
Adams, Kennedy & McVee,	7000 00	Constructing part of the canal above the upper arch.
Wilson Bryan,	2744 53	Constructing guards, and flood gates, bridges, &c.
Warner W. Minor,	1719 00	Excavation and embankment.
Charles & Patrick Kelly,	710 00	Raising and shaping banks.
Simms & Winston,	100 00	Quarrying stone.
Jno. P. Shields,	2985 00	Clearing western mouth of Tuckahoe, and making bridge and culverts.
David I. Burr,	2362 75	Making culverts for locks and passing streams.
Norvell & Hall, David Norvell and William Hall,	430 25	Excavation and embankment.
Philan & Cronan,	650 00	" "
Scrymger & Young,	650 00	Building walls and buttresses.
Wm. B. Lipscomb,	26 30	Brick work near armory.
Shields & Griffin,	420 00	Excavating Tuckahoe creek.
Hetherton,	450 00	" " "
. & M. W. Shields,	750 00	" " "
Enos,	350 00	" " "
nt carried over,	$ 57,890 77	

Amount brought over,	$ 57,890 77	
Serymger, Young & Bryson,	1600 00	Building locks.
Daniel McFall,	150 00	Building culvert.
R. & C. Hyde,	220 00	Making gates, and putting up hand-rails.
Levi Swain,	100 00	Making lock-gates.
M. Green,	300 00	Mason work of a lock.
L. Barns,	369 05	Iron work of lock-gates.
Timothy Callaghan,	220 00	Excavation and embankment.
	$ 60,849 82	
Amount disbursed under the contract of John Staples, on this part of the canal,	4300 05	
Engineer, superintendence and contingencies,	1500 00	
	$ 66,649 87	

[No. 2.]

Amount of expenditure during the present season, between Tuckahoe creek and Pleasants's Island.

On the contracts of		*Contracts.*
David I. Burr,	$ 187 29	Castings for piling machines.
John M. Redford,	3,177 45	Excavation and bridges.
Reuben Burton,	3,001 80	Excavation and embankment.
John G. Crouch,	2,400 00	“ “
Scrymger, Young & Bryson,	2,410 00	Quarrying and walling.
John G. Gamble,	10,500 00	Building locks.
William Goode,	1,350 00	Excavation and embankment.
James Boyd,	2,400 00	Building Dover aqueduct.
Reins & Malone,	1,600 00	Excavation and embankment.
Knox & Hale,	1,500 00	“ “
David Wallace,	1,550 00	Building culverts and bridge.
Charles Griffin,	500 00	Excavation and embankment.
Jackson, Winston & Campbell,	600 00	Work on Tuckahoe aqueduct.
Henry Easely,	100 00	Walling.
Pleasant Gordon,	500 00	Excavation and embankment.
Joshua Enos,	280 00	“ “
Bowles & Burford,	725 00	“ “
David Houston,	1,950 00	Blasting and walling.
Mulholland & Fullerton,	720 00	Excavation and embankment.
Jasper Crouch,	446 93	Attending to sick.
Adam Dunlop,	330 00	Excavation and embankment.
William Hall,	100 00	“ “
Baker & Richards,	1,450 00	Building a lock.
R. P. Baker,	200 00	Building a culvert.
William Gill,	522 23	Delivery of timber.
M. Lehy,	100 00	Excavation and embankment.
William Digges,	565 00	Blasting and walling.
John Donnelly,	80 00	Building a waste.
George Coxson,	200 00	Excavation and embankment.
W. B. Winston,	150 00	Masonry on abutment of Tuckahoe aqueduct.
S. D. Crenshaw,	695 00	To furnish lime.
	$ 40,290 70	
To this amount add for hand hire in piling and flooring foundation of Tuckahoe aqueduct,	400 00	Disbursed under John Staples's contract.
For Roman cement, and New York water-proof lime furnished contractors, and timber,	1,500 00	
Engineering, expenses, and contingencies,	2,000 00	
	$ 44,190 70	
If to this sum we add } Being the amount paid } for damages of land, }	4,352 71	
We shall have an aggregate amount, on 1st December, of	$ 48,543 41	

[No. 3.]

A table, shewing the amount of expenditure on the James River Canal, between the upper arch and the western mouth of Tuckahoe creek; with the amounts deemed requisite to complete and bring into operation this portion of it.

Amount expended by the late James river company, previous to their dissolution on the 1st of May, including estimated amount of directors' salaries and superintendence,	$ 22,000	00
Amount expended during the present season, by the commissioner of the James and Jackson's river canal,	66,649	87
There will be wanted, to complete the contracts of Adams, Kennedy & McVee, the locks of Scrymger, Young and Bryson, and to wall between them, to embank around them and unite the lower lock with the canal below, and to finish the old canal,	11,200	00
For expenses of hands employed by the commissioner in raising and finishing banks, repairing injuries, and completing the contract of Lyons & Carter,	5,000	00
For completing the excavation through Shapard and Ferguson's farms, and constructing a guard-lock at Ferguson's fish-pond,	7,000	00
For completing the excavation of Tuckahoe creek, its flood-gates and bridge across it, and finishing the lock at Wickham's bridge,	7,400	00
For completion of lock and dam at Fore's fish-dam,	7,000	00
For engineering, expenses, superintendence and contingencies, 8 per cent.	3,208	00
Making an aggregate of	$ 129,457	87

Or an average sum per mile of $ 13,350.

Note.—A large proportion of the sums here stated as requisite to complete this section of canal may be considered as already expended, though reserved by the commissioner to ensure the completion of the respective contracts on which they are due. It will be observed, that no estimate is made for fencing the canal. The commissioner thinks it probable that this expense may be avoided by well-constructed gates at the different dividing fences. Should it be requisite to fence the canal, his estimates will of course fall short by the sum necessary for this purpose, and for damages of land.

A table, shewing the amount of expenditure on the James River canal, between the lower lock, constructing by John G. Gamble, on John Wickham's upper farm, and the site of the dam proposed by Messrs. Moore and Briggs, with the amounts deemed requisite to bring into operation this portion of canal, and three miles and fifteen chains more, between the said site and that now proposed at the Maiden's Adventure Falls.

Amount expended by the commissioner,	$ 48,543	41
There will be wanted to complete the locks, the aqueduct, the embankments and basins at Tuckahoe,	31,000	00
To complete the excavation, walling and blowing, and for making a farm-bridge in the Tuckahoe estate,	8,500	00
Thence to complete the canal, including puddling, blasting, and one farm-bridge to Manakin town ferry road,	6,000	00
Thence to lock in Sampson's, including waste, culverts, and two bridges,	5,850	00
For completing lock and excavation in Sampson's farm, and walling around a cliff at the western extremity of his land,	9,950	00
For passing Stony creek, including embankments and walling,	6,700	00
For excavating in Jos. & Dr. Watkins's farm, and canalling around cliff in Jos. Watkins's,	10,500	00
For completing Dover aqueduct, including puddling and embankments,	6,000	00
For completing canal through Dover, including blasting and bridges,	7,000	00
For cast iron culverts to pass Genito creek, and correspondent stone work,	5,100	00
For ditching and lowering creek and culverts in Dover,	2,200	00
For excavation, culverts and bridges in Dr. Trent's farm,	19,500	00
Thence, excavation of canal to point proposed by Moore & Briggs as the head of the section,	5,200	00
For paving the banks of the canal above Pleasants's island, to prevent abrasion by freshets,	1,200	00
Amount carried forward,	$ 173,2[illegible]	

Amount brought forward,	$ 173,243 41
Thence to Maiden's Adventure, the ground has not yet been laid off for contract. It is ascertained, however, from its general depth of cutting, and an examination of the obstructions it presents, that an average sum of $ 12,000 per mile, will cover all charges: 3 miles and 15 chs. at $ 12,000,	38,250 00
At this point, a dam to divert the water into the canal; a guard-lock for its protection, and a lock to accommodate the trade during its erection, and afterwards, should it be required, are estimated at	20,000 00
For engineers, superintendence and contingencies, 6 per cent.,	10,977 00
	$ 242,470 41
To which sum add, for damages to land-owners,	8,000 00
And we have an aggregate of	$ 250,470 41
Or for this portion of the canal, 15 miles 36¼ chains, an average cost of $ 16,200 per mile.	

Note.—In this estimate, as in the last, the expense of fencing the canal is not added; nor has any estimate of the cost of a dam, guard lock and lift-lock, at the site proposed by Messrs. Moore & Briggs, been made, because it was believed that such an estimate would be unnecessary. The additional height of the dam would certainly add much to its expense, and the want of an eligible site for the locks would add materially to their cost also. If to these items be added, what may be supposed a reasonable amount for the damages which would be sustained by the erection of a dam at this site, we shall have an aggregate not very far short of what will be required to extend the section to the Maiden's Adventure Falls.

[No. 4.]

Amount disbursed in clearing out and opening sluices on James River, between the old locks and Crow's ferry, up to the 1st December, 1823.

By James McColgan, under his contract,	$1,533 19
By John Staples, under his contract, for hand hire furnished Jas. McColgan, and materials and provisions,	593 95
Making an aggregate of	$2,127 14

Amount disbursed by John Staples, in widening and deepening the old canal,	$16,956 00
On the canal of Briggs and Gamble, the old locks and the dam at the upper arch,	2,650 00
	$19,606 00

Whole amount expended and paid by the commissioner, up to the 1st of December inclusive:

Disbursed by John Staples on the old canal, the contract of Briggs & Gamble, and the dam at the upper arch,	$19,606 00
On the bed of the river,	2,127 14
Between the upper arch and the western mouth of Tuckahoe creek,	66,649 87
Between Gamble's lower lock and Pleasants's island,	48,543 41
	$136,926 42
Paid small amounts due by the James River company,	178 50
Whole amount expended during present season,	$137,104 92

REPORT OF THE COMMISSIONER

OF THE

KANAWHA ROAD AND NAVIGATION.

To the honorable Speakers and Members of both Houses of the General Assembly of Virginia.

GENTLEMEN,

As soon as I heard of my appointment to the office of commissioner of the Kanawha road and navigation, I prepared the bond which was required by law for me to give for the faithful performance of the duties of said office: and whilst waiting to know if it would be accepted by the James River company, on the application of Hugh P. Taylor, I employed him as an assistant, and to act as an engineer on said road, and on Kanawha river, for the sum of $ 1,000 per year. He commenced the duties of his office on the 6th day of last March. As soon as the second auditor informed me that my said bond was accepted, I proceeded to attend the operations on said road. The first business I found necessary to do, was to complete the alteration in the location of the road, (which I proposed last year,) from near the end of the 10th mile, to near the end of the 24th mile; which case, by the direction of the then road commissioners, I laid before the James River company last December. A plan of this change of the location is in the paper marked A. The reasons which induced me to make this alteration were,

First—It put the road on much better ground, where the greater part of it is under the acclivity and declivity of 5 degrees: and the greater part of the former location is at the grade of 5 degrees; and in some places it exceeds 5 degrees; to correct which, would very much increase its length. I examined two suspicious parts at W. and X., and found, that to graduate those places at 5 degrees, would increase the length of the road near one half mile.

Secondly—By this change, I avoided the crossing of several creeks, and the making of several expensive bridges, as will appear by said plan, marked A.

Thirdly—I do not think it practicable to take the road over Mill-creek, by a bridge at C., or in any other way. The engineer's report, (which is made part of Caruthers's contract with the James River company,) requires a bridge 99 feet long, with the abutments and pier, 35 feet high, and 1340 cubic yards of filling in the abutments. This bridge would be perpendicular to the side of a hill, on the left side of the creek, the declivity of which is 36 degrees. This hill appears to be a solid rock, with a thin coat of earth over it. And, how a sufficient curve could be cut for the road out of this hill, so as to enable a waggon and team, with safety, to get on and off a bridge, without encountering great expense, I have yet to learn. And this road must be supported several poles by a stone wall, a part of it at least 30 feet high. And,

Fourthly—The creek at this place lies in a deep ravine, between two rough high hills, that, when the bridge would require repairing, there would be no way for carriages to pass. The difference between the distance of the road, agreeable to this change and the engineer's location, agreeable to his survey and report, is about one mile and 39 poles. But, when his location is properly graduated, as was before observed, perhaps the difference of distance may be in favor of the new way.

The next duty which I was required to perform, was to ascertain on which side of New River and Kanawha, the road should be finally located, from the Narrow Falls of New River, down to a safe boat-harbor, below the Great Falls of Kanawha. This I deemed a case of great responsibility. A deep interest appeared to be excited in the minds of the people, on both sides of the river, from the Great Falls to the mouth of Coal. Having, last November, in conformity to an order of the James River company, with one of the road commissioners, and John Bosher, the agent of the company on Kanawha river, surveyed the left side of the river, from the proposed ferry to the boat harbor, near Montgomery's; and the right side of the river from Montgomery's ferry, past the Great Falls, and across the mouth of Gauley river, to the proposed ferry on New-River; and from thence to the Narrow Falls, (a plat of which is marked B.,) at that time, with the aforesaid gentlemen, I examined the sites for bridges over New River and Gauley river, and, also, made an estimate of what appeared to us would be the expense of taking the road over New River, (by a bridge,) and down on the left side of New River and Kanawha, to the boat harbor at A.; and, also, what appeared to us would be the expense of continuing the road down the right side of New River, across the mouth of Gauley, and down the right side of Kanawha to the boat-harbor, below the fall rock at C.; and from thence to the boat-harbor near Montgomery's landing at B. By which estimates, it appeared that, taking the road on the left side of these rivers would be attended with the greatest expense.

Finding that the James River company did not act on this case, and that I must, I again carefully examined both sides of these rivers. At E. at the narrow falls, where the river is 254 feet wide, it was proposed to make a bridge, but I found that was not practicable, because we could not get down from the location of the road on the right side of the river to such a bridge; it was then proposed to make a bridge over the river a small distance below the mouth of Carie creek, from a large rock at D., on the right side of the river, to a large flat rock on the left side thereof. Here the river is about 475 feet from one of these rocks to the other; and the whole length of the bridge extending over the large flat rock, (which overflows in high-water,) would be 815 feet. The river here rises about 10 feet above common water-mark; and when we add to the fall of the river from E. to D. the force which the water acquires by being let loose through the narrows at E., it appears to me to be almost impossible to build piers at D. to resist so great and powerful a force of water and floating timber as there is at this place, in times of great floods. At the proposed site for a bridge over Gauley river, where I have now commenced building at I., the river spreads wide; the bridge will be about 530 feet long; the water smooth, and only strong when Gauley is high and New River low. The rise of water here, appears to be about 11 feet above common water-mark. I also examined the road on both sides of the river to Charlestown; I found that the right side has more of the winter sun, and not so many difficult creeks to pass as there are on the left side. To make a road on the left side of the river, from the site proposed for a bridge at D., to the proposed ferry, would be very expensive and barely practicable; and to continue the road to the boat-harbour at A., would also be very expensive, and part of this road would be so under the north side of the high cliffs, that the sun, in winter, can hardly touch it. The road on the right side of the river from Carie creek to H., and about 10 [illegible]on's mill, will be expensive to make; but [illegible] to make a road on the left side of the [illegible]icable,) will be much more expensive than to continue the road on the right side; and to make a bridge at D., (if practicable,) much more expensive than to make the bridge over Gauley at I. The boat-harbour at A. is the best, but the other boat-harbours, C. and B. are very good. The road from D. down the right side of the river to the boat-harbour at C. is about 80 poles longer than from D., on the left side of the river to A., it being the convex side of the river; and from C., on the right side of the river to Charlestown, is shorter than from A. on the left side of the river to Charlestown, the right side being the concave side, and best to the sun, and will make the best road. After carefully weighing all these considerations, I decided in favor of continuing the road down on the right side of the river, and to extend the turnpike to Montgomery's ferry, below B.

On the twenty-second day of July last, I contracted with James Moore of Pennsylvania, to build bridges over Gauley and Greenbrier rivers for $ 18,000 each, (Mr. Baldwin, a former engineer of Virginia, estimated the expense of building these bridges at $ 20,000 each.) A copy of this contract is marked C. This was the best contract I had in my power to make. Mr. Moore has commenced the bridge on Gauley, and is progressing well with the work.

Believing the improvement of the navigation of Kanawha river an object of very great importance, I felt anxious to commence that work, and immediately gave notice in several newspapers of general circulation, of my wish to receive proposals for the improving and completing of a part, or of the whole of the navigation of this river, but received no proposition that I could consider myself justifiable in accepting, till the season was far advanced. I had doubts of the utility of the machinery which captain Bosher had provided, and I thought it advisable to make a small contract to prove the utility of this machinery, and not to let the season pass away without some work being done. Accordingly, about the first of September last, I contracted with col. Philip R. Thompson to improve and complete the navigation of Tyler and Elk shoals, for the sum of $ 3,500. A copy of this contract is marked D. Thompson has progressed well. Mr. Taylor, my assistant, has reported to me that the sluice at Tyler's shoal is finished, and that the improvement of Elk shoal is nearly completed, agreeably to contract.

On the 24th day of last month, I contracted with Morrison and Epley, two gentlemen from Pennsylvania, to improve and complete the navigation of said river from its confluence with Ohio river, to Slaughter's creek, for the sum of $ 41,132.

This contract, signed by the parties, is marked E. The paper marked F. is their letter of recommendation. And at the same time, I contracted with David Smiley, who is also from Pennsylvania, to complete the navigation of said river from Slaughter's creek, to the Great Falls of said river, for the sum of $ 8,868. A copy of this contract is marked G. This makes the whole expense to be incurred in completing the navigation of Kanawha river, (according to law) from its confluence with Ohio river, to the Great Falls of the former, including col. Thompson's contract, $ 53,500. In making these contracts, there were two difficulties to be overcome; the first was the great uncertainty of the seasons, as to high and low water: when the river is above common water mark, the work cannot progress, and the contractor is subjected to great expense by his hands being idle. For this reason, the contractors claim the term of four years to complete the work, but it is understood by the parties, that if the two first seasons should be favorable, the work will be done within two years, it being the interest of the contractors to finish as soon as possible. The other difficulty was, that, some how or other, it became generally believed, that the work already done, had cost a very large sum of money; consequently, the contractors' reasoning was, that they must be paid in the same proportion for the work now to be done. I think the improvement of the navigation of this river is a very important object; the revenue arising from its trade will be very considerable, and a few years will reimburse the expense of completing it. I have waited till the season was nearly past, to obtain a good contract. I have made the best that was in my power, and it is less by several thousand dollars, than any other proposal that was made to me.

As to the Kanawha turnpike road, I have not had it in my power, this season, to pay that attention to it that I wished. A line of work of 70 miles of road, and the attention of Mr. Taylor and myself, frequently drawn to Kanawha river, has so employed my time, that I have been seldom two or three days at a time in one place. However, the work on the road has progressed well. There, perhaps, was never more work done in one season, by the same number of hands; all the road, (except about 2½ miles,) from near the mouth of Gauley to Lewisburg, which is near 60 miles, is worked on, in removing rock, excavating the earth, and in throwing up the road. Near three miles, on the end of Gauley mountain, is nearly finished. From a point in the 9th mile, eastwardly, extending through the Gauley settlement, and through Dog-wood gap to Bracken's hill, a distance of about 15 are finished, with the exception of a little dressing off, and a few culverts; between the 26th mile and Lewisburg, there are upwards of 20 miles finished, with the exception of a little dressing off. All the bridges between Lewisburg and Gauley are made, except the filling up of the abutments of a few of them; some of them I have not had time to examine the mason work, and consequently have not received.

Between Lewisburg and the Alleghany mountain, there are about 11 miles worked on, the greater part of which is nearly finished, except the bridging. And at the east end of the road, next to Covington, there are 9 miles worked on and nearly finished, except two hard points, and the bridges across Dunlop's creek.

I expect a toll gate will be erected at the White Sulphur Spring, before the next season commences; and another between Lewisburg and Gauley river. I have purchased a boat, and have it in the care of —— Walker, where the bridge is now building on Gauley, till the first of next March, for the purpose of keeping a ferry, till the bridge is completed. And on the first of March next, I intend to commence taking toll for ferriage for the James River company. This west end of the road is so opened, that it is now travelled considerably by persons on horseback.

This turnpike road, when completed, will be an excellent road of the kind; it generally passes through a part of the country, which affords firm soil for a road, with the exception of a few places, particularly the flats of Meadow river; these flats lie so on a plain with the horizon, that in time of great rains, they are overflowed with water so deep, that it is not practicable to make the road high enough to avoid overflowing. These meadows are generally composed of a thin soil of vegetable earth, over a compact dense clay, which, when well thrown up, becomes dry, and makes an excellent road; and if the water should run over it in the summer season, it will not injure it, but if it should overflow with water in the winter, at the time of the frost melting in the spring, it will become so soft, that the wheels of carriages will very much injure it; indeed, at this season, it may become hardly passable for heavy loaded waggons. I would, therefore, recommend the capping of this part with stone, which will not exceed 1½ miles: a small distance, say 40 poles, on Big Swell creek, is in the same situation.

In examining Kanawha river, from the Great Falls down, about five miles, including Long and Loop creek shoals, it appears to me that these shoals are so rapid, and so long, that it will be difficult, so to construct the sluices through them, that the water will not have too great a velocity for steam navigation. In my contract with Smiley, he is bound so to graduate these sluices through these shoals, that the fall will not be more than five vertical inches to one hundred feet distance; but, the longer the sluice, the more force the water acquires, which makes me doubtful that these sluices will be too strong for steam navigation. To continue the road from Montgomery's ferry to the lower end of Loop creek shoal, will not be expensive, it being generally good ground for a road.

All the necessary arrangements are now made, for the work on the Kanawha road and river, to progress next season with spirit. But, there is one difficulty remains, and that is, in conformity to the contracts which are now made, there will be, in the course of next season, a considerable number of payments to make at different times, to contractors on the road and river. It will be a great hardship to be obliged, every time one of these payments is to be made, (particularly those for work on the river,) to send upwards of three hundred miles to Richmond, for the money.

Could not the Legislature, with propriety and safety, authorise the depositing of money with some person properly qualified as a treasurer, either in Lewisburg or Charlestown? This case I would respectfully submit to the consideration of the Legislature, hoping that in their wisdom, they will devise some measure to obviate this difficulty.

I am, with great respect, yours, &c.

WILLIAM ANDERSON,
Commissioner of Kanawha Road and Navigation.

N. B. I have not yet received any part of the turnpike road from the contractor.

I had forgot to state, that when I examined the location of the road on Howard's creek, (a map of which is marked H.,) I found that the location from A. to B. in the greater part of this distance, was so exposed to the wash of the creek, that it would be imprudent to attempt to make a turnpike road of it. I therefore altered the location to the red dotted lines running from A. to B., which puts the road on safe ground, from the wash of the creek, and avoids two crossings of the creek at C. and D.; and consequently saves the expense of two bridges.

By John Caruthers's contract with the James River company, to make the road from Covington to the Falls of the Great Kanawha, for $ 90,000, he appears to be bound only to make one bridge across Howard's creek, and that is at 2, near

Hunter's house. Consequently, there will be two extra bridges to build over said creek, one at F. and the other at I. There will, also, be one extra bridge to build over Dunlop's creek.

WILLIAM ANDERSON,
Commissioner Kanawha Road and Navigation.

N. B. The above alteration of the road on Howard's creek, makes the distance a little shorter.

* * *

Agreeably to John Caruthers's contract with the James River company, for making the Kanawha turnpike road, at the expiration of every three months after he commenced operations on the road, he might call on the company's agent or superintendent of the road, to have his work valued, and on the certificate of such valuation being presented to the company, they would pay to Caruthers two thirds of its amount. The following is a statement of all the valuations that has been made of Caruthers's work on said road:

1822.					
Sept. 21,	The value of work estimated at			$ 10,998	90
Dec. 31,	Ditto	"	ditto	7,055	94
1823.					
May 9,	Ditto	"	ditto	9,449	61
Aug. 9,	Ditto	"	ditto	16,926	00
Nov. 20,	Ditto	"	ditto	21,797	60
				$ 66,228	05
	Two thirds of which is			$ 44,152	04

This sum of $ 44,152 04, together with the sum of twenty thousand dollars which the James River company advanced to Caruthers when he commenced operations on the road, is all the money which he has received. There will be two or three bridges to make over Dunlop's and Howard's creeks, which Caruthers in his contract was not bound to make, unless he was paid for them over and above the sum mentioned in his contract.

WM. ANDERSON,
Commissioner Kanawha Road and Navigation.

REPORT

ON

THE JAMES RIVER CANAL,

BY CLAUDIUS CROZET.

In compliance with the order of the Board of Public Works of the 3d inst., I visited the canal in company with the commissioner and the engineer, and report as follows:

The canal along James River is attended with difficulties incident to all lateral canals, but which are still increased in the present instance by various local causes. If a canal of this description be kept in low grounds, its excavation is generally easier, but it is liable to injuries from freshets: if it be kept above the reach of these, many obstacles and consequent expenses must be encountered; in addition to this, the necessity of accommodating the trade of the south side, and of occasionally procuring a fresh supply of water, make it necessary to come down to a low level; hence, the additional expense of dams, guard-locks or guard-gates, temporary locks, &c.; and, also, injuries from freshets, or expensive embankments to keep them off.

As to the trade of the south side of the river, where there is an absolute necessity that it should be accommodated, there is no way to avoid the expenditure and inconvenience relative to it; but, where this may be dispensed with, it appears to me, that a greater distance than 16 miles may be placed between the feeders. The authority of Judge Wright, in this matter, is certainly entitled to the utmost respect; but, would not an examination of the facts show causes of the deperdition of water that are only temporary or local? It is well known, that newly moved earth is, according to its nature, from 1-6 to 1-10 more bulky than after having completely settled; it is consequently porous in proportion. On the much too famed canal of Lauguedoc, rapid filtrations subsided after the introduction of turbid waters into it: for a distance of upwards of 40 miles, the water was supplied only by the principal reservoir, and if any inconvenience has been felt in regard to the want of water, it has been owing more to the diversity of fall of the intervening locks, than to evaporation or filtration. Let the earth be properly rammed and puddled in suspicious places, and I doubt whether the loss of water will exceed, in any instance, half an inch in a day, which is the greatest loss that has ever been observed in a well settled canal. But, I will grant, that in a very hot day it will be 3-4 of an inch, and I think that it is still practicable to supply that daily deficiency on a much longer distance than 16 miles. Many ways may be devised to accomplish this object: the fall of the locks may be lessened in a combined proportion of their distance from the feeder and the length of each intermediate basin; by this means, the loss of water would be compensated in proportion of the activity of the trade: proper regulations may be established to keep the basins filled to a certain height. A diminution of width and an increase of depth in the most distant sections will, also, be effectual in lessening the daily filtrations and evaporations.

If the canal be extended above Maiden's Adventure, I should be of opinion to take in but few feeders, with this precaution, however, to come down low enough near the most eligible dam sites, there to take in a feeder, if circumstances should require it. An attempt to carry on a canal with as few feeders as practicable, is every where advisable, but becomes more so in the case of a river whose extraordinary width renders dams so expensive as they prove to be on James River. In prosecuting this plan, even if intermediate feeders should become necessary, there would at least be found the advantage of doing away the necessity of temporary locks through each dam.

It is, also, proper to remark, that although tributary streams are generally a precarious dependance, and fail precisely at the time of need, it can hardly be supposed that there will not be, along the whole line, a single spring that never dries up, and which, being received into the canal, with the usual precautions against alluvions, would amply compensate both evaporation and filtration for a great distance.

Among the difficulties peculiar to this canal, must also be numbered, the ignorance of the exact quantity of water discharged by each tributary stream, which produces much uncertainty in properly fixing the opening of the culverts that are to convey them under the canal, in order that, by a just proportion either accidents or unnecessary expense may be avoided. The only way to come near the truth, as to unknown streams, is to deduce their water-way in freshets from that of those streams which turn mills, and are otherwise known by means of this rule: that the water discharged is proportional to the square of the length of the streams.

The new canal begins at the old lock, thence to Currie's bridge it is completed, with the exception of the locks, which are much advanced.

From the Tuckahoe aqueduct to the 4 feet lock in Sampson's farm, the excavation is nearly completed, the culverts made and likewise some bridges.

The foundations of the 4 feet lock are made, and the materials prepared.

From there to Maiden's Adventure, a distance of about 10 miles, some work is done, but only in places.

The three lock-pits at Tuckahoe creek are excavated, and stone are preparing. The guard-lock at that place is nearly finished.

The foundations of the Tuckahoe aqueduct have been piled and some stone has been prepared.

The dam at Fore's fish dam is half made.

The operation of getting stone, and some excavation, have begun at Maiden's Adventure.

Some sections of the canal are exposed to be overflowed by high freshets, the principal of which is from Ball's sluice to the guard-lock; the next is Tuckahoe creek. Some of the canal in the vicinity of Maiden's Adventure will be subject to the same inconvenience which, as I have had occasion to observe, cannot be avoided near feeders, except by an additional expenditure for high embankments, and even with this the river will force its way through the lower culverts, or else the small streams must be suffered to overflow.

As to Tuckahoe creek, it is probable that some expense has been saved by making its channel part of the canal; but, on the other hand, it cannot be denied that some inconvenience will result from this location, which would have been avoided by the more expensive plan of keeping the canal on a higher level.

It would appear from the information I have obtained, that this part will be overflowed when other low places will not; and consequently, will oftener be liable to depositions of sand. I am not sufficiently acquainted with the nature of the freshets in James River, to give an opinion as to the actual extent of this inconvenience, but certain it is, that the creek being now shut out of this channel, depositions may take place which did not before; and I entertain some doubt as to the possibility of removing the same, by creating a current from time to time, in the former bed of the creek. This section has, however, over the other low sections, the advantage that its banks are not exposed like theirs to destruction by freshets.

The site of the dam at Maiden's Adventure from the account given of the levels, appears greatly superior to that originally proposed; some precaution will, however, be required to protect the works immediately in the vicinity of the dam, against the increased rapidity of the water over that place; and also, against the alluvions of Beaver Dam creek, which is so near that it must, in all probability, be received into the feeder.

As to the execution of the work, it would be impossible for me to make a complete report, since I could judge only of the external parts above the water or the ground. The following are the remarks which I have been able to make:

Where the soil is sandy, I think that the present slope is inadequate, and that 2½ to 1 would be a more eligible ratio for the part under water. In addition to this, it would be expedient to leave on a level with the surface of the water a berme, of from 2 to 3 feet between the bank and the water: On this berme some aquatick plants might be planted, which would break the agitation of the water, and insure the preservation of the upper slope, which might without inconvenience remain as it now is.

The locks appear well built and of good materials. I noticed in them a construction for which I cannot conceive any reason, and which I think might be dispensed with, since it is both troublesome and somewhat more expensive. Instead of raising the face of the wall vertically, or giving it all along, a regular batter, its bottom is made a straight line, and the top forms an arc, whose sagitta is about 9 inches. The curved surface which unites these two lines is neither graceful nor necessary. I suppose that this construction originated in the necessity of keeping the walls vertical, in the space occupied by the gates, and the advantage of giving them a batter in the chamber of the lock; and that the above mentioned method was devised, to change the batter unperceived by the eye. I would recommend the more simple plan to form a regular batter in the length of the lock, and to break it near the gates by a perpendicular recess, which would then present the appearance of a triangle having for its base the whole batter, and for its height that of the wall, its vertex resting on the bottom of the lock.

The stone of which the guard lock at Wickham's farm is built, appears to be excellent; but that which is intended for the other locks at that place, appears not to be so good. Some of the blocks I have examined scale at the surface; this, however, is not generally the case.

Masonry being one of the chief expenses of a canal, I will take this opportunity to remark that, though prudence recommends to rather over-rate the pressure than fall short of it, yet economy fixes a limit to the dictates of prudence. I will, therefore, submit the following rule, which I have calculated on the supposition, that the water in a lock rises to within one foot of the top of the wall, and that this wall is to be grouted.

Until a wall has attained the height of 9 feet, it may be made 4½ feet thick. Over this height, its top remaining 4½ feet, its base must increase behind by 9 inches to each foot increase of its height.

According to this rule, a wall of 11½ feet high, would be 4½ feet thick at top, and about 6 feet 4 inches at its base: instead of a regular slope behind, it will be more advisable to form a certain number of retreats or steps without increasing the quantity of masonry.

Opposite the gates, the wall must be raised vertically on its base.

This construction shews, that the dimensions of the lock-walls rather exceed the necessary proportions; and, indeed, it is only on account of the propriety of opposing filtrations, that the top in low walls is made so thick as 4½ feet.

In regard to the facing of the wall, it will be advantageous to give it a batter of ½ or ¾ of an inch to the foot.

While on this important subject, it may not be amiss to correct an opinion which has been advanced by a very eminent engineer, Belidor, that a batter behind a wall tended to weaken its resistance. This mistake is owing to the state of philosophical knowledge in the time of this celebrated writer, and deserves the more to be noticed, that his works, from their superior degree of excellence, are entitled to a confidence which gives them the pre-eminence among all the writings on that subject.

The reverse of this proposition is true, viz: There is more pressure against a vertical wall than against any other. The truth of this may be at once understood by considering that, if the earth acts as a wedge, it is well known that the blunter the wedge, the less its power.

The advantages of a sloping wall are not confined to economy: To this important desideratum may be added:

1°. That a broader basis is a better security for the foundation, since the weight is distributed over a greater surface.

2°. That filtrations being proportional to the head of water, they are more effectually opposed by a wall whose dimensions increase with the power of percolation.

3°. When a wall is overthrown by a pressure, it does not all rise out of its foundation, but, as is proved by experience, it breaks at a plane which inclines about 45° to the horizon, and passes nearly through the exterior line of the base of the wall on the surface of the ground. Hence because this rupture is opposed by the tenacity of the mortar, the broader its basis the greater this resistance.

If I think the walls laid in mortar quite sufficient, I am far from saying the same of the dry walls: there is a kind of practical rule which gives the top of a wall three feet in thickness, and increases the same by a batter of 2 inches to the foot. This unfortunate rule I consider as the original cause of the accidents that have happened in several places, and threaten in many others where the walls have swelled, and buttresses have become necessary. These effects are particularly remarkable in the convex parts where the wall has necessarily less stability.

The defects of dry walls are numerous:

1°. While great care is taken to secure the foundations of walls of masonry, those are generally neglected, and yet as there is no connexion between the stones, it is hardly possible to prevent partial settlings, which tend to the destruction of the wall.

2°. The whole weight of the masonry and proportional resistance, are diminished by the interstices left between the stones.

3°. If these interstices be filled, some small stones being pressed between larger ones by the upper weight may act as wedges to displace them.

4°. The weight of large stones resting only on few sharp points, these points are crushed: very frequently the stone splits and the stability of the wall is destroyed.

5°. They suffer water to penetrate to the earth, whose pressure is thereby increased.

6°. They are seldom built with care, although more attention is perhaps requisite to arrange stones where they are not to be cemented by the accession of mortar.

What then must be the dimensions of dry walls?

To this question, I can only give an answer, founded on the supposition that they are built with large stones, arranged with care, without wedging stones in the interstices; and also that these interstices are not considerable enough to greatly diminish the whole weight of the wall.

The laws of philosophy prove, that the greatest pressure is about at 1-3 of the height of the wall; a fact which is verified by all the weak walls of the canal, which swell about that height. From this and the above remarks, I draw the following conclusions:

1°. That a broad base is indispensable in such walls.

2°. That this base must diminish but little, up to one third of the height of the wall.

3°. That from this point to the top, a greater batter may be given.

4°. That no stone longer than three times it height, must be placed in the lower part of the wall, and none longer than five times its height, any where except at the coping.

I think, that with the last precaution, the following dimensions might be relied on:

1°. The thickness of the wall to be one fourth of its height at top, (but never less than 3 feet.)

2°. The base to be one half of the height of the wall.

3°. The wall to be raised with a batter of two inches to the foot, to within one third of the whole height, from which point to the top, a regular slope may be made.

In addition to all the foregoing precautions, the earth must be well rammed, as it is raised behind the wall; for, it results from numerous experiments, that the pressure of loose earth is three times as great as that of the same earth when rammed. Another reason why the earth should not be placed loose behind the wall is, that it may then be easily penetrated by water, and that its pressure would, in such a case, be considerably increased. Some soils which, when dry, would stand in a slope of 45°, will, when humected, hardly bear an inclination of 18° to the horizon.

When a wall is too weak, the first effect remarked, is a breaking of the ground at a distance of 2-3ds of its height from it; when such an effect is observed, it is an indication of an immediate want of buttresses. In the case of a high wall holding up a canal, the crevice may take place in the bottom of it; this effect is then indicated by leaks, which tend to accelerate the fall of the wall.

Pavements, instead of dry walls, are often resorted to against the abrasions of a current, and ought, in many instances, to be preferred. The only inconvenience that attends the paving of slopes is, that if their base does not rest on a safe foundation, they are apt to slide down, especially when the earth is soaked with water, an effect which they are ill calculated to prevent.

In speaking of masonry generally, I was led to the foregoing remarks on dry walls; but, it appears, that their imperfection had been perceived previous to the construction of the new part of the canal, for there the walls seem to have been built with much more care. Some of them have even been made with a greater batter, and it is hoped, that in all that section they will answer their purpose. I remarked, indeed, at Harris's waste, a dry wall, which I thought too weak, but I was told that at that place the ground stood almost vertical, in which case there can be but an inconsiderable pressure against the wall.

The location of wastes is generally judiciously made.

In low grounds, where there was not sufficient elevation to use common culverts, cast iron ones have been had recourse to. The only objection that could be raised against this improvement is, that they are liable to be affected by changes of temperature; but, if made sufficiently thick and well cast, there does not appear any reason why they should not answer as good a purpose as the iron bridges and aqueducts of England. They are certainly cheaper than syphon culverts of stone.

The principal stone aqueduct on the canal is that at Dover: it will soon be completed. Orders have been given to turn the arch without delay, in order to secure the centres against the danger they would be exposed to in a freshet. Other precautions have also been taken against that occurrence.—Among the operations of the last year, the widening of the canal was one of the most important. From the situation of the canal, this operation must have been attended with more difficulty than seems to have been anticipated. The most economical plan, was undoubtedly to remove the bank farther down the hill. On this subject, it may not be amiss to remark that on a level, the expense of deepening increases much more rapidly than that of widening, but on the hill side the reverse takes place: the expense of widening increases very fast, and in many instances it would cost to widen a canal 3 feet, double the sum that would deepen it the same number of feet, and considering that the expense of a canal on a hill side is like that of a road in a duplicate ratio of its width, it must be evident, that the increase of one third of the width, must cost as much as the original expense of excavation: if it be remembered besides that a canal cannot, like a road, accommodate itself to the irregularities of the ground, the ratio must be conceived to be yet greater: it is, therefore, a matter of importance to make a canal as narrow, as convenience permits on a hill side, especially as a greater width must increase the part of the bottom which rests on made earth.

Before closing this report, I beg it to be recollected, that this is the first time I have had an opportunity to examine the canal, and as the order of the Board did not specify the objects to which my attention must be particularly directed, I could take but a general survey of the whole business, and may have omitted some of the points which, in order to meet their views, ought perhaps to have received a more minute examination.

C. CROZET, *P. E.*

Richmond, 12th February, 1824.

RICHMOND, 17th February, 1824.

To the President and Directors ex-officio of the Board of Public Works.

GENTLEMEN,

Since writing my report on the James River Canal, I received from col. John G. Gamble, the hereto annexed letter, which explains the presence of some defective blocks among the stone, which is preparing for the locks in Wickham's farm: The colonel informed me farther, that these imperfect blocks were not only cut without his knowledge, but that he rejected them as soon as he saw them. Not being aware of this circumstance, I naturally inferred from their being cut, that they were intended for use. These defective stones being discarded, I think that the others will prove of good quality, as I intimated in my report at the conclusion of the paragraph relative to this section of the work.

I have the honor to be,

Your most obedient servant,

(*Signed,*)

C. CROZET, *P. Engineer.*

RICHMOND, February 15, 1824.

Claudius Crozet, Esq.

DEAR SIR,

Having been favored with a view of your report of the 12th current, in which you state that some of the stone intended for the locks about to be erected in Mr. Wickham's farm, is deficient in quality, I feel it incumbent on me to state, that no defective stone will be put into those locks. That complained of, was cut without my privity and knowledge. A regard to my own reputation will ensure the greatest care in the selection of the materials. The stone is of a coarser grain than that used in the guard lock; but I believe will prove more durable.

Very respectfully,

Your most obedient servant,

(Signed,)

JOHN G. GAMBLE.

JAMES RIVER COMPANY.

2nd AUDITOR'S OFFICE,
4th February, 1824.

Sir,

In obedience to a resolution of the General Assembly of the 3d instant, I herewith transmit the following statements, viz:

A. Summary statement of loans obtained to effect the improvements on the James and Kanawha rivers, and to construct the Kanawha road; and of the expenditure thereof, between the 17th day of February, 1820, and the 31st day of December, 1823, inclusive.

B. Summary statement of the revenue of the James river company, between the 24th of February, and 31st day of December, 1823, inclusive; and of the expenditure thereof.

C. Statement shewing how far the revenue of the James River company is capable, on the 1st day of January 1824, of paying the expenses, dividends and interest due on that day.

D. Estimate of the probable state of the revenue of the James River company, at the expiration of the year 1824.

I have the honor to be, sir,
With great respect,
Your most obedient servant,
J. BROWN, Jr. *2d Auditor.*

The honorable the Speaker of the House of Delegates.

[A.]

SUMMARY STATEMENT

Of Loans obtained to effect the improvements on the James and Kanawha Rivers, and to construct the Kanawha road, and of the expenditure thereof, between the 17th of February, 1820, *and the* 31*st December,* 1823.

Loans obtained prior to the act of 24th February, 1823, - -				$161,600 00	
Loans obtained between the 24th day of February, 1823, and the 31st of December, 1823, inclusive, - - - - -				203,000 00	
					364,600 00
EXPENDITURES.	*Prior to 24th Feb.* 1823.	*Since the 24th February.*		*TOTAL.*	
Improvements on James River,	$ 92,093 66	165,392 77		257,486 43	
" on Kanawha River,	33,037 69	3,736 50	36,774 19		
Kanawha Road, - - -	35,121 62	33,416 53	68,538 15		
				105,312 34	
Salaries of 2d auditor and clerk,		408 00		408 00	
					363,206 77
	$160,252 97	202,953 80			
Balance of loans unexpended and in	the treasury	31st Dec'ber,	1823,	- - - -	$ 1,396 23

(*E. E.*)

J. BROWN, JR. *Second Auditor.*

31*st January,* 1824.

[B.]

SUMMARY STATEMENT

Of the revenue of the James River company, between the 24th February, 1823, and the 31st December, 1823, and of the expenditure thereof.

RECEIPTS.

Balance of tolls and rents of water and ground, unexpended by the late company and paid into the treasury in March and May last,	$ 1,182 98		
Tolls and rents received since, and paid into the treasury,	20,207 15		21890 13

EXPENDITURES.

Ordinary and contingent expenses:

Salaries of toll-gatherers and lock gate keepers,	$ 1,556 25		
Stationery, fee bills, printing, coal, &c.	114 15		
White-washing and painting toll-house and repairing,	51 50		
Balance due and paid W. Foushee, as settled by the late company, for medical attendance on hands hired by the company, from 1802 to 1820, inclusive, and for trees, nails, &c.	919 74		
		2641 64	

Dividends:

In part of $ 3,614 12, the amount due of dividends declared prior to and unclaimed on second May, 1823,	$ 996 00		
In part of July, 1823, dividend of $ 8,400,	7,848 00		
	$ 8,844 00		
Amounts carried forward,	$ 8844 00	2641 64	21890 13

Am'ts brought f'd,	$ 8,844 00	2,641 64	21,390 13
Interest on certificates of loans :			
On $ 331,600 to the 1st July, 1823, the whole amount borrowed to that date,	7,443 67		
		16,287 67	
			18,929 31
Balance of revenue in the treasury on 31st December, 1823,			$ 2,460 82

(*E. E.*)

J. BROWN, Jr. *2d Auditor.*

31*st January,* 1824.

◆

[C.]

STATEMENT,

Shewing how far the revenue of the James River company is capable, on the 1st day of January, 1824, of paying the expenses, dividends and interest, due on that day.

The charges on the revenue are,		
For expenses :		
Salaries of toll-gatherer, lock-gate keepers, &c.,		$ 743 33
For dividends :		
Arrearages due for dividends heretofore declared but not called for,	$ 3,170 12	
January, 1824, dividends,	8,400 00	
		11,570 12
For interest on certificates of loan :		
On $ 364,600, the whole amount borrowed up to 31st December, 1823, inclusive,		10,256 92
Amount carried forward,		$ 22,570 37

Amount brought forward,		$22,570 37
The means to discharge which are:		
Cash balance in the treasury on account of the revenue, (see statement B.)	$2,460 82	
Yearly rents of water and ground, due the 1st January, 1824, including those in arrear for 1822,	4,032,69	
		6,493 51
Leaving a deficiency to pay dividends of	5,819 94	16,076 86
Interest of	10,256 92	

Note.—The deficiency to pay dividends, will be made good out of the accruing receipts from tolls, (see statement D.)

The deficiency to pay interest on certificates of loans, has been provided for out of the surplus fund and annual appropriation of $ 18,000, from the fund for internal improvement.

(*E. E.*)

JAMES BROWN, JR. *2nd Auditor.*

31st January, 1824.

[D.]

ESTIMATE

Of the probable state of the revenue of the James River company, at the expiration of the year 1824.

RECEIPTS.

Tolls for twelve months, as estimated by the James river company, in April, 1820, from the receipt of the five preceding years,	$29,100 00	
Rents of water—present annual amount,	3,140 00	
Rents of ground—present annual amount,	350 00	
		32,590 00
Amount carried forward,		$32,590 00

Amount brought forward,		$ 32,590 00

EXPENDITURES.

Expenses:		
Salary of toll-gatherer, who finds a clerk,	$ 2,000 00	
Salary of upper lock-gate keeper, who finds an assistant and two hands,	747 00	
Salary of lower lock-gate keeper, (at the Basin,)	200 00	
Stationery, fuel, expenses of board, &c. &c.,	143 00	
		3,090 00
Nett revenue,		29,500 00
This nett revenue is, in the first place, applicable to discharge,		
Dividends to January, 1824, inclusive, which the revenue of 1823, after having paid the interest on certificates of loan due the 1st of July, 1823, was insufficient to discharge, (see statement C.,) by the sum of	5,819 94	
Dividends due 1st July, 1824, and 1st January, 1825,	16,800 00	
		22,619 94
Leaving a probable surplus of revenue on the 1st of January, 1825, for the payment of interest on loans due on that day, (in part,)		$ 6,880 06

Note.—It will be seen by the above statement, that the amount of interest becoming due on the 1st July, 1824, on certificates of loan, cannot be paid out of the receipts of tolls and rents in 1824. It will consequently be chargeable on the annual appropriation for that purpose, from the fund for internal improvement.

(*E. E.*)

J. BROWN, Jr. *2d Auditor.*

31st January, 1824.

DISMAL SWAMP CANAL COMPANY.

To the President and Directors
Of the Board of Public Works.

The Directors of the Dismal Swamp Canal Company perceive from a view of the annual report made to the General Assembly, at its present session, that no notice is taken of the memorial presented by this Company to your Board at their regular annual meeting in December last. They flatter themselves, that the omission is not to be ascribed to any indifference on the part of the Board to the improvement in question: its importance in every point of view, and the large interest held by the Commonwealth in its capital stock, forbid such a conclusion, no less than the patronage and assistance hitherto afforded by your Board. The Directors feel confident, that the subject of their memorial will claim your attention at your next meeting, which, it is understood, will be held towards the end of the present month; and they avail themselves of the delay which has taken place, to present a condensed, view of the actual state of their canal, which, it is believed and hoped, will, in your opinion, afford sufficient reasons to induce you to grant the aid required; or such other assistance, as in your better judgment the interest of the State, and of the Company may demand. At this time, from the lock at the northern outlet, connecting with the waters of Virginia, to the feeder from Lake Drummond, a distance of 12 miles, there is navigation for boats drawing at least 4 feet 6 inches of water; from the feeder to a stone lock near Farange's, a distance of 6 miles, there is navigation of 5 feet 6 inches; from the last mentioned lock to the wooden lock at the southern outlet connecting with the waters of North Carolina, a distance of 4 miles, there is navigation of 4 feet. The stone locks are 96 feet long in the clear, 18 feet wide in the clear, and have 7 feet of water on the lower sills of each, while the wooden lock at the southern outlet, through which the products of Albemarle Sound and the Roanoke river must enter the canal, is but 75 feet long and 14 feet wide, and has but 3 feet of water on the lower sill. From this statement of the present condition of the canal, it will appear manifest that although the canal is of a capacity and depth sufficient to afford, at the least, 4 feet of navigation, not more, if so much as 3 feet can be enjoyed; and the community and the company are deprived of all the benefits and facilities which ought to re[illegible] the enlargement of the work, from the want of a s[illegible] the southern outlet, corresponding with the other stone locks. A lock at this point with 7 feet of water on the lower sill, and gates of more lift, which would allow of raising the banks, would not only admit vessels of the largest size, designed to be employed in the Sound and canal navigation, but would at the same time increase the depth of water throughout a distance of 4 miles, from 4 feet to 4 feet 6 inches, or five feet if required. The inconvenience and loss sustained for the want of it, may be most satisfactorily exemplified by adverting to the sources of revenue during the past year, and with that view the Directors beg leave to state that of the income of $ 6551 92, derived from tolls, $ 5080 10, were collected upon the products of the Swamp and surrounding country, leaving but $ 1471 82, which were received from articles entering the south end of the canal.

JOHN COWPER,
GEORGE McINTOSH,
JOHN TUNIS,
JOHN TABB.

ACTS AND RESOLUTIONS

OF THE

GENERAL ASSEMBLY,

RELATING TO THE

BOARD OF PUBLIC WORKS,

Passed at the sessions of 1821-1822, 1822-1823, *and* 1823-1824.

AN ACT,

Concerning the James River company, and the fund for Internal Improvement.

[Passed March 2, 1822.]

1. *Be it enacted by the General Assembly,* That the president and directors of the Board of Public Works shall be, and they are hereby required to pass to the credit of the fund set apart for the payment of the interest, and the purchase of the certificates of the James River loan, two hundred and ten shares of the stock of the Bank of the United States, in satisfaction of the sum of twenty-three thousand three hundred and seventy dollars and fifty-nine cents, now due to that fund; and that the future dividends declared upon the said shares, shall be passed to the credit of the same account.

2. *Be it further enacted,* That, whensoever any certificates of the James River loan shall be offered for sale to the collector of the Board of Public Works, at par, the said collector shall, by order of the Board of Public Works, if in session, or of the members of the board ex-officio, in the recess of the

Board, sell so many of the said shares as may be necessary to effect the purchase of the certificates so offered for sale.

3. *And be it further enacted*, That, for the future, so much of the annual appropriation from the income of the fund for internal improvement, for the payment of the interest, and purchase of the certificates of the James River loan, as may not be necessary for the payment of interest, shall be invested, by order of the Board of Public Works, in some productive fund, until the same shall be wanting for either of the purposes aforesaid; and then to be re-converted into money, as aforesaid.

4. This act shall be in force from the passing thereof.

AN ACT,

Giving further time to the Upper Appomattox company to pay the debt due to the Commonwealth.

[Passed February 22, 1822.]

1. *Be it enacted by the General Assembly*, That the further time of four years, from the passing of this act, be allowed to the Upper Appomattox company, to pay the Commonwealth the sums loaned to the said company, including as well the interest now due, as that which may grow due before the time aforesaid.

2. This act shall be in force from the passing thereof.

AN ACT,

Authorising a survey or examination of Slate River, by the public engineer, and for other purposes.

[Passed February 1, 1822.]

1. Whereas, by an act of Assembly, passed on the twenty-ninth of January, eighteen hundred and nineteen, a company was incorporated under the name and title of the "trustees of te river," for the purpose of clearing, improving and ex-

tending the navigation of that river, from its junction with James River, to the highest practicable point of improvement; and whereas, it is represented to the General Assembly, that three fifths of the capital stock of that company have been raised by the contribution of individuals; and that a subscription from the fund for internal improvement, of the remaining two fifths of the stock, is invited by the company and desired by the good people interested in the navigation of Slate river; and whereas, it is expedient and proper that the State should previously avail itself of the lights to be derived from the civil engineer and the Board of Public Works:

2. *Be it enacted by the General Assembly*, That the Board of Public Works be, and they are hereby authorised and required, as soon as may be consistent with existing engagements, to cause a survey or examination to be made by their engineer, of Slate river, from its junction with James River, to the highest practicable point of improvement; and that they thereupon make report to the General Assembly, as to the expediency and propriety of a subscription, from the fund for internal improvement, of two fifths of the capital stock of the trustees of Slate river.

3. This act shall be in force from the passing thereof.

AN ACT,

To amend the act, entitled, "an act concerning the Monongalia navigation company."

[Passed March 2, 1822.]

1. *Be it enacted by the General Assembly*, That if, from any cause, the election of the directors of the Monongalia navigation company shall not be made at the time prescribed by law, the said company shall not thereby be dissolved, but the directors in office shall continue until an election can be had, after thirty days notice thereof at the door of the court house of Harrison county; and in the mean time, the said directors shall possess all the powers of directors of the said company. If no such election shall take place, then the said directors shall, to all intents and purposes, be considered directors until the next annual election prescribed by law.

2. This act shall be in force from the passing thereof.

AN ACT,

Respecting the Fauquier and Alexandria turnpike company.

[Passed February 27, 1822.]

Whereas it is represented to the General Assembly, That the Fauquier and Alexandria turnpike company have, according to the act of incorporation, proceeded to pave about twenty miles of said road; that they have expended all the funds of said company, and that there remain unpaved, about eight miles; and whereas, it is represented that the said road is of great public utility, and it is therefore expedient that the Commonwealth shall take part of the stock of the said company; and whereas, it is fit and proper that the Legislature should previously avail itself of the light to be derived from the Board of Public Works:

1. *Be it therefore enacted by the General Assembly,* That the Board of Public Works shall be, and they are hereby authorised and required to institute the requisite enquiries, and to report to the General Assembly at its next session, its opinion, accompanied by such information as it may then possess, relative to the expediency and propriety of a subscription on the part of the fund for internal improvement, to the stock of the Fauquier and Alexandria turnpike company.

2. All acts and parts of acts, coming within the purview of this act, shall be, and the same are hereby repealed.

3. This act shall be in force from the passing thereof.

AN ACT,

Increasing the stock of the Snicker's Gap turnpike company; and authorising the Board of Public Works to subscribe for the same.

[Passed February 27, 1822.]

1. *Be it enacted by the General Assembly,* That the Snicker's Gap turnpike company shall be authorised to increase their capital stock four hundred shares; and the Board of Public Works are hereby authorised to subscribe for the same, payable by semi-annual instalments of five thousand dollars,

from the first day of February next: *Provided*, That, previous to such subscription, satisfactory evidence shall be given to the said board, that the money subscribed shall be exclusively applied to improvements on the said turnpike road, and that the creditors of the said company assent to such application: *And provided, also*, That the fund for internal improvement be allowed to participate, in proportion to its stock so taken, in all dividends declared by the company from the time of paying the first instalment.

2. This act shall be in force from the passing thereof.

AN ACT,

Concerning the Lynchburg and Salem turnpike company.

[Passed February 28, 1822.]

Whereas, an application has been made to the General Assembly, on behalf of the Lynchburg and Salem turnpike company for a subscription to the stock of that company from the fund for internal improvement; and whereas, it is requisite and proper that a previous report should be made by the Board of Public Works:

1. *Be it enacted by the General Assembly*, That the Board of Public Works shall be, and they are hereby authorised and required to report to the General Assembly, at its next session, their opinion, together with such information as they may possess, touching the expediency or inexpediency of a subscription on behalf of the fund for internal improvement to the stock of the Lynchburg and Salem turnpike company.

2. This act shall be in force from the passing thereof.

AN ACT,

Incorporating the president, directors and company of the Wellsburg and Washington turnpike company.

[Passed March 2, 1822.]

1. *Be it enacted by the General Assembly,* That the president, directors and company of the Wellsburg and Washington turnpike company be, and they are hereby made and constituted, a body politic and corporate, by the name and style of, "the president, directors and company of the Wellsburg and Washington turnpike company;" and by that name shall have perpetual succession, and a seal, with power and capacity, by the name and style aforesaid, to sue and be sued, plead and be impleaded, in all courts of law and equity, or elsewhere; and the said company, their officers, servants, property and agents, shall, in all cases, be subject to the provisions of an act of the General Assembly, entitled, "an act prescribing certain general regulations for the incorporation of turnpike companies."

2. And whereas the said company has already been formed, and more than one half of their stock subscribed, and directors appointed, to serve until the sixth day of October, one thousand eight hundred and twenty-two; *Be it therefore enacted,* That, until their successors be appointed and qualified, the said subscriptions for stock, with the appointment of commissioners, directors and other officers, shall be, and the same are hereby ratified and confirmed to all intents and purposes, as if the same never had been done under the said recited act, or an act of incorporation made in pursuance of the principles of the said recited act.

3. *Be it further enacted,* That the president and directors of the Board of Public Works shall be, and they are hereby authorised and required to report to the General Assembly, at its next session, whether it be expedient and proper to subscribe, on behalf of the Commonwealth, to the stock of said company, five thousand dollars, upon the terms and conditions upon which the present stockholders in the said company have subscribed: *Provided,* That, previous to such subscription, satisfactory assurance shall be given to the board, that the money subscribed shall be exclusively applied to improvements on the road.

4. *Be it further enacted,* That the summer road, adjoining the paved part of the said road, shall be nine feet only, and

shall not be necessary on the upper side of the said road, when the same shall be cut in the sides of steep hills.

5. *Be it further enacted*, That, on account of the extreme steepness of the hill sides leading to Panther run, and from the top of the river hill to Wellsburg, a summer road on the upper side, of four feet only, shall be necessary.

6. The tolls on the said road shall be after the following rates per mile, that is to say: for every score of sheep or hogs, two cents; for every score of cattle, three cents; and so in proportion for a greater or less number; for every horse, mare, mule or gelding, one cent; for every two-wheeled riding carriage, two cents; for every four-wheeled riding carriage, six cents; for every cart or waggon, the wheels whereof do not exceed four inches in width, two cents for every four-footed animal drawing the same; and for every cart or waggon, the wheels of which exceed four inches in width, and roll less than seven inches, one cent for every four-footed animal drawing the same; and for every cart or waggon, the wheels of which are seven inches or more in width, one half cent for every four-footed animal drawing the same: *Provided*, That return waggons or carts shall pay one half of the said tolls only, which tolls may be collected at each toll-gate.

7. This act shall be in force from the passing thereof.

AN ACT,

To amend the act, entitled, "an act to create a fund for internal improvement.

[Passed February 22, 1823.]

1. *Be it enacted by the General Assembly*, That so much of the ninth section of the act, entitled, "an act to create a fund for internal improvement," as declares that the Board of Public Works may have power to adjourn the board for any period not exceeding six months, shall be, and the same is hereby repealed; and that hereafter the meeting of said board shall be once in each year, at the time and place now prescribed by law.

2. This act shall be in force from the passing thereof.

AN ACT,

To require all annual reports to be made to the Legislature on the first day of the session, and for other purposes.

[Passed February 15, 1823.]

Whereas, it appears to the General Assembly, that the transaction of the public business would be greatly expedited by the reception, at the commencement of each session, of all the reports which are now required by law to be annually made to the Legislature;

1. *Be it enacted*, That all the functionaries and agents of the government, who are now required by law to make annual reports to the Legislature, shall hereafter make the same on the first day of each session: *Provided, nevertheless*, That the president and directors of the Literary Fund, and the Board of Public Works, shall make their respective annual reports on or before the fifteenth day of each session.

2. *And be it further enacted*, That the rector and visitors of the University of Virginia, shall hereafter make their annual report to the president and directors of the Literary Fund, on or before the first Monday in December in each year, to be laid before the General Assembly at the commencement of each session.

3. *Be it further enacted*, That whensoever any visitor of the said University shall have failed to perform the duties of his office for twelve months, it shall be the duty of the board, at their next meeting after the expiration of the said twelve months, to enter such failure in the minutes of their proceedings; and, if no sufficient cause for such failure be shewn to the board, they shall cause it to be certified to the Executive, that the seat of such visitor is vacated, in order that the vacancy may be supplied; but, if sufficient cause for such failure be shewn to the said board, at any time before they shall have certified the same to the Executive as aforesaid, the seat of such visitor shall not thereby be vacated. If, however, so many of the said visitors shall, at any time, fail to perform the duty for one whole year, as not to leave a quorum to form a board without them, it shall be the duty of the rector to certify such failure to the Executive; and thereupon the seats of such visitors shall be vacated, and the Executive shall proceed to fill the vacancies.

4. This act shall commence and be in force from the passing thereof.

AN ACT,

Making more effectual provision to carry into effect the act, entitled "an act to amend the act, entitled 'an act for clearing and improving the navigation of James River, and for uniting the eastern and western waters by the James and Kanawha rivers, and for other purposes."

[Passed February 24, 1823.]

Whereas, by an act passed on the 17th day of February one thousand eight and twenty, entitled "an act, to amend the act, entitled 'an act, for clearing and improving the navigation of James river, and for uniting the eastern and western waters by the James and Kanawha rivers," the James river company were directed to effect a canal navigation from the tide water of James river, to the mouth of Dunlap's creek; to make a road from thence to the great falls of the great Kanawha river, and to render the latter river navigable from the great falls to the river Ohio; and the present General Assembly, being fully sensible of the great interest which the good people of this Commonwealth have in the success of the said objects, deem it necessary to adopt a more effectual mode to give them effect, than that heretofore provided:

1. *Be it therefore enacted*, That from and after the commencement of this act, all the powers and duties of the existing president and directors of the James river company, except as herein-after provided, shall be superseded and annulled, and thereafter no other election of president and directors shall be made in the manner now provided by law; but the governor, lieutenant governor, treasurer and auditor of Commonwealth for the time being, and the second auditor, whose office is created by this act, and their successors in office, shall be ex-officio the president and directors of the said company, of whom the governor shall be president; and the said governor, lieutenant governor, treasurer, auditor and second auditor, from the time aforesaid, as president and directors of the said company, shall succeed to and possess all the rights, powers, duties and privileges of the existing president and directors, except so far as may be otherwise provided by this act. A board for the transaction of the business of the said company, shall be constituted by any three, or more of the said officers. In the absence of the governor from the board, the lieutenant governor shall be president pro tempore; and in the absence of both, the treasurer shall preside.

2. *And be it further enacted*, That there be appointed annually, by joint ballot of both houses of the General Assembly, an officer to be denominated the second auditor, whose duty it shall be to keep distinct accounts of the receipts and disbursements of the Literary Fund, of the fund for internal improvement, and of the fund constituted to effect the purposes of the act, the title of which is recited in the preamble to this act. He shall draw all warrants authorising the treasurer to receive monies on account of any of the funds before mentioned, after the amount shall have been adjusted by the other auditor, when by law he is authorised to adjust the same, and audit all claims properly chargeable on them, and issue warrants to the persons entitled thereto. He shall act, ex-officio, as accountant of the Literary Fund, as clerk of the president and directors thereof, and as secretary of the Board of Public Works; and the powers and duties of the persons holding those offices, respectively, shall thenceforth cease. And the said second auditor is hereby authorised to appoint a clerk, should the board of directors hereby established deem one necessary, to aid him in the discharge of his duties. All books and papers in any manner connected with the constitution, administration or regulation of the funds herein before mentioned, shall be deposited with the said second auditor, who shall carefully preserve them.

3. All monies belonging to any of the funds herein before mentioned, shall be kept in the public treasury, separate from other public monies; and regular and distinct accounts shall be kept of the receipts and disbursements, and a report thereof annually made by the treasurer to the General Assembly, on or before the fifth day of its session.

4. It shall be the duty of the James river company, forthwith to pay into the public treasury any money which may remain in their hands, whether the same has been received from loans, tolls, rents or otherwise; and they shall file with the second auditor, an account of their receipts and disbursements since the commencement of the act herein before mentioned, which he shall carefully preserve: and all monies hereafter accruing to the said company, whether for tolls, rents, loans or otherwise, shall be accounted for by the several collectors and other agents, with the second auditor, and paid upon his warrant into the treasury: *Provided, however*, That, if existing engagements with any toll-gatherer, collector, or other agent, shall require the money falling into his hands to be otherwise accounted for and paid, it shall accordingly be accounted for and paid pursuant to such engagement; and the

person receiving it shall, without delay, account for it with the second auditor, and pay it into the treasury, as above prescribed.

5. *Be it further enacted*, That the president and directors of the James river company shall, without delay, proceed to borrow, from time to time, as they may deem it prudent, at an interest not exceeding six per centum per annum, so much of the three hundred and fifty thousand dollars, which they have been heretofore authorised by law to borrow, as has not yet been borrowed; and if the president and directors should find it necessary to the completion of the three first sections of the work described in the second section of the act recited in the preamble to this act, that is to say, to render the Great Kanawha navigable from the falls to the Ohio; to improve the navigation of James river from tide water to Pleasants's island; and to make the road from the mouth of Dunlap's creek to the Great Falls of Kanawha, together with the bridges provided for by this act; then, and in that case only, they are hereby authorised and required to borrow an additional sum not exceeding eighty thousand dollars. And to enable them the more readily to procure the said loans, they are hereby authorised and required to cause all the monies which shall be so loaned to them, to be paid into the public treasury, by the lender, on the warrant of the second auditor; and, upon the payment of each sum so loaned, the treasurer shall issue a certificate of stock for the amount thereof, purporting that the Commonwealth owes to such lender, his executors, administrators or assigns, the sum loaned, together with interest thereon, at the rate agreed upon, not exceeding six per centum as aforesaid, and payable semi-annually, at the treasury of the Commonwealth, computing the time from the date of the certificate. Such certificate shall also shew, on its face, that the loan was made by authority of this act; that the principal sum loaned is irredeemable for twenty years; and afterwards to be redeemed at the pleasure of the General Assembly. It shall be signed by the treasurer, countersigned by the second auditor, and registered in a book to be kept by him for that purpose, and shall then be delivered to the lender, or his agent. Every such certificate of stock shall be transferrable on the books of the second auditor; and the semi-annual interest thereon shall be paid upon his warrant. The certificates of stock for monies heretofore borrowed by the James river company, may be produced by the owners to the second auditor; and shall thereupon be registered by him in a book to be kept for that purpose; and at all times afterwards, they shall be transferrable on the books of the said auditor. The interest

falling due on such certificates, after they shall have been so registered, shall be paid at the treasury, on the warrant of the second auditor, without the re-production of the certificate; and the interest, falling due on them before such registry, shall be paid at the treasury, on the warrant of the second auditor, to be granted on the production of the certificate. The tolls collected on James river since the fifteenth day of March, eighteen hundred and twenty, and those which may hereafter be collected, the nett proceeds of the tolls to be collected on the Great Kanawha river, and from the road and bridges, all water rents, and rents of land, to which the James river company is or shall be entitled, together with the annual sum of eighteen thousand dollars to be paid out of the revenue of the fund for internal improvement, are hereby pledged as a fund for the payment of the dividends to the stockholders of the James river company, and the payment of the interest on the loans heretofore made to said company, pursuant to law, and hereafter to be made pursuant to this act; and no part of the said fund shall be diverted to any other purpose: and the General Assembly, moreover, pledge themselves, that they will, from time to time, provide such other revenues as shall be necessary to pay the interest on any loan authorised by law, to carry into effect the improvements mentioned in this act.

6. Nothing in this act shall be in any wise construed, so as to take away, or in any manner impair the security or preference pledged to those who have heretofore loaned money, by authority of law, to the James river company.

7. *Be it further enacted,* That deeds for the transfer of any share or shares of the stock of the James river company, held by any person, body politic or corporate, executed in the manner prescribed by law for the conveyance of real estate, attested and proved by two witnesses, or certified by justices of the peace, in the manner prescribed for the authentication of deeds for real estate, and registered in the office of the second auditor, in a book to be kept by him for that purpose; also, devises of such share or shares, duly executed, proved and recorded in some court within this Commonwealth, certified and registered in the second auditor's office, in the manner aforesaid, shall be sufficient to entitle the transferree or devisee, to the dividends on such shares.

8. The dividends due, or to fall due, to the owners of the shares of the stock of said company, shall be paid at the treasury, on the warrant of the second auditor.

9. *Be it enacted,* That an officer be appointed, annually, by nt ballot of both houses of the General Assembly, to be de-inated the commissioner of the James and Jackson's river

canal, whose duty it shall be to execute the provisions of the said act, so far as respects the construction of locks, navigable canals, and other necessary works, from tide water to the mouth of Dunlap's creek, in the manner directed by the said act, and according to its true intent and meaning; and all the powers and rights heretofore vested by law in the James river company, for the purposes aforesaid, and within the limits aforesaid, are hereby vested in such commissioner; and it shall, moreover, be the duty of the said commissioner, to keep the bed of the river in a good and convenient state for navigation, between Crow's ferry and the point to which any new improvement shall be completed for use, and connected with the river.

10. Before the said commissioner shall proceed to the execution of his office, he shall enter into bond with one or more good and sufficient securities, in the penal sum of forty thousand dollars, payable to the James river company, conditioned that he will, faithfully and honestly, and to the best of his abilities, perform the duties of his said office, according to the laws now in force, and such as may be passed by the General Assembly, from time to time; and he shall, moreover, take an oath or make affirmation that he will faithfully and honestly, and to the best of his abilities, perform the duties required of him by law; that he will not, directly or indirectly, be concerned or interested in any contract which may be made with him or any person on his behalf, for any labor, material or other thing necessary for the prosecution of the said works; and every contract, made in violation of such oath, shall be utterly void. If said commissioner shall either directly or indirectly be concerned or interested in any contract, in violation of this act, it shall be deemed and taken to be a breach of the condition of the bond herein required to be executed by him, and judgment shall be entered against such commissioner and his securities, for a sum not less than the amount of said contract, nor more than twice the amount of said contract, at the discretion of the jury.

11. *Be it further enacted*, That there be appointed, in manner before-mentioned, another officer, to be denominated the commissioner of the Kanawha road and navigation; whose duty it shall be to carry into effect such of the provisions of the act herein-before-mentioned, as direct the constructing and completing a road from the mouth of Dunlap's creek, to the great falls of the great Kanawha river, and that the latter river shall be rendered navigable from thence to the river Ohio, according to the true intent and meaning of said act; and all the powers and rights heretofore vested by law in the

James river company, for the purposes aforesaid, and within the limits aforesaid, are hereby vested in the said commissioner.

12. Before the last mentioned commissioner shall be authorised to execute the duties of his office, he shall enter into like bond, and take like oath or affirmation with that directed above, in relation to the commissioner of the James and Jackson's river canal; and the said commissioner of the Kanawha road and navigation, with his securities, and the contracts made by him, shall be subject to the like rules and regulations, liabilities and recoveries, as are prescribed above in relation to the commissioner of the James and Jackson's river canal, his securities and contracts. The bonds executed by the commissioners aforesaid, and the certificate of their oath of office, which may be administered by any justice of the peace, shall be filed with the second auditor, before they shall, respectively, be authorised to enter upon the duties of their office.

13. *Be it further enacted,* That the said commissioner shall give their constant attendance in directing and superintending the respective improvements necessary for the promotion and final accomplishment of the objects contemplated by the act herein-before-mentioned, and respectively confided to them. Each commissioner shall appoint such engineers, managers or agents, as he may think necessary, who shall be under his control, and removeable at his pleasure: *Provided,* That the engineer appointed by the Board of Public Works, shall, whenever, upon the application of said commissioners, he shall be directed by the ex-officio members of said board, attend the commissioners of the James and Jackson's river canal, and of the Kanawha road and navigation, when previous engagements of the engineer on subjects of greater importance do not interfere. The said commissioners shall, each respectively, on behalf and in the name of the James river company, make such contracts for labor, materials, or other thing necessary in the prosecution of the work in their several precincts, as each of them may deem expedient. And a copy of every contract shall be immediately transmitted by the commissioner making the same, to the second auditor, to be carefully filed and preserved; and all reports of engineers, or estimates of work, shall in like manner be transmitted by the commissioners, and filed and preserved.

14. All monies which may become due to any person or persons, by virtue of any contract made with either of the said commissioners, by virtue of this act, shall be paid by the treasurer out of the funds provided for the improvement of James river, on a warrant from the second auditor, which shall be

issued on the order of the commissioner who authorised the contract; in which order, the consideration on which it is founded, shall be expressly stated: *Provided, however,* That no warrant shall be drawn by the second auditor, on any such order of the commissioner, unless the contract on which it is founded shall be filed with the said auditor, and shall appear to justify it. And, in order to prevent, as far as possible, any failure in the payment of any such sum of money, the said commissioners, respectively, shall, from time to time, ascertain the state of the disposable funds in the hands of the treasurer, and regulate themselves accordingly in making contracts.

15. Every contract made by the James river company, with any person or persons, relating to, or connected with the purposes of the act herein-before-mentioned, shall be as valid as if the powers of the said company had continued. And the said commissioners, respectively, shall carry the same into effect as the said company could, or ought to have done; and all claims for money which have heretofore accrued, for services, labour, materials, or other thing, shall be settled and audited by the second auditor, and he shall grant warrants for such sums as may appear to be justly due. As to all monies falling due on or before the first day of May next, upon contracts now existing, made by the James river company, or under their authority, they shall be adjusted and settled under the authority of the president and directors of said company, now in office; and warrants shall be granted by the second auditor for the amount due, upon the certificate of said president and directors: *Provided,* Such settlement be made on or before the said first day of May. But, if such settlement be not made on or before that time, then the claims shall be settled and adjusted by the respective commissioners aforesaid, and the warrants granted upon their certificates. All superintendents, agents, and other officers appointed by the James river company, shall continue in office, pursuant to their appointments, till they shall be superseded, by appointments under this act, or their offices annulled by the provisions thereof.

16. The said commissioners shall, each, respectively, before the fifteenth day of every session, make full and detailed reports of their transactions, to the General Assembly, stating at length the expenses incurred by their contracts, or otherwise, and the progress of the work, and any other material matter that they may deem proper.

And whereas it is rep[illegible], that it may be necessary to erect bridges over the [illegible]er river, and also over New river or Gauley river

17. *Be it therefore enacted*, That the commissioner of the Kanawha road and navigation, shall have power to erect such bridges, if the same shall be found to be practicable at a reasonable expense; and, when completed, that he cause to be collected such tolls as may be reasonable, to be revised or altered by the Legislature, as they may think necessary. And it shall be the duty of the said commissioner to transmit a list of the tolls to the General Assembly, at its next succeeding session; and likewise cause a list of said tolls to be recorded in the county where the bridge or bridges may be situate.

18. *And be it further enacted*, That the said last mentioned commissioner shall be, and he is hereby invested with full power and authority to collect the tolls directed to be collected by the act aforesaid, on the river Kanawba, and the road between the mouth of Dunlap's creek and the great falls of the Great Kanawha river; and, to this end, all the rights and powers vested by the law in the James river company, are hereby vested in the said commissioner; and payment for tolls to be imposed for passing the bridges, may be enforced in the same manner, and under the same regulations, as tolls on turnpike roads are collected and enforced.

19. Before the said commissioner shall have power to proceed to the collection of any of the said tolls, he shall execute a separate bond, with good and sufficient security, in the penalty of forty thousand dollars, payable to the James river company; conditioned, that he will make due returns of all tolls; well and truly account for all monies which may come into his hands by virtue of this act, and regularly pay the same into the treasury, at the end of every six months, commencing from the date of the bond; and if he shall fail to make such returns regularly at the end of every six months, or within twenty days thereafter, it shall and may be lawful for the general court, on the motion of the second auditor, on behalf of the James river company, to enter up judgment against the said commissioner, and his securities, for a sum not exceeding five hundred dollars, and costs; and such motion and judgment may be repeated until a compliance with the provisions of this act shall be enforced: *Provided, nevertheless*, That the general court, at their succeeding term, shall have power to open such judgment, if it shall appear to them that the failure complained of was owing to circumstances which justified or extenuated it, and that the commissioner had not a fair opportunity to make them known, at the term when the judgment was rendered against him; and the court may thereupon give such judgment as to the penalty, as the very right of the case may require.

20. *Be it further enacted*, That if from any semi-annual return herein-before directed, it shall appear that there is any sum of money in the hands of such commissioner, and he shall fail to pay the same within twenty days after the period up to which such return has relation, it shall be lawful for the general court, on the motion of the second auditor, on behalf of the James river company, to render judgment for the amount so appearing to be due, with interest at the rate of ten per centum per annum, from the time such return closed, and costs: *Provided, nevertheless*, That nothing in this act contained shall be so construed, as to prevent the said commissioner from discharging any proper claim which ought to be paid according to the provisions of this act, out of any monies in his hands; but that, on furnishing proper vouchers, he shall be entitled to a credit for the sums so disbursed.

21. *Be it further enacted*, That so much of the act herein-before-mentioned, or any other act, as provides for the appointment of ten commissioners, denominated "the commissioners for the Kanawha river and road," and for the appointment of nine other commissioners, denominated "the commissioners for the James and Jackson's rivers," be, and the same is hereby repealed: and all the power and authority of the said commissioners shall henceforth cease and determine.

22. *Be it further enacted*, That, whenever it shall become necessary to subject the lands of individuals to the purposes provided for in the said act, and the consent of the proprietor cannot be obtained, it shall and may be lawful for the said commissioners, within their respective precincts, to enter upon such lands, and proceed to the execution of such works as may be requisite; and that the pendency of any proceedings, in any suit of the nature of a writ of ad quod damnum, or any other proceedings, shall not hinder or delay the progress of the work: and no order shall be made, or injunction awarded, by any court, by which the progress of the work shall be arrested; it being the true intent and meaning of this act, that all lands shall be liable to condemnation, and that the proprietor shall be compensated in damages. And it shall be the duty of every court to give precedence to controversies which are now pending, or which hereafter may arise, relative to the condemnation of land for any public purpose whatever, and to determine them in preference to all other causes; and no abatement or dismission of any cause now depending, shall take place, by reason of any thing contained in this act.

23. *Be it further enacted*, That it shall and may be lawful for the commissioner of the James and Jackson's river canal, to subject to condemnation, any land which may be necessary

for the purpose of erecting dams for feeders, or any land through which feeders may be conducted, and for the purpose of establishing reservoirs, in the same manner as lands are authorised to be subjected by law for the canal.

24. *And be it further enacted*, That, in any future assessment of damages, on behalf of any proprietor of land through which the canal or feeder may be conducted, no compensation for any fencing to separate the land condemned for the use of the James river company from his other lands, shall be allowed; nor shall any compensation be made to any such proprietor for any bridge or bridges over such canal or feeder; but such bridges and such additional fencing as shall have become necessary, by reason of such canal or feeder, shall be constructed by the commissioner of the James and Jackson's river canal, wherever he may deem them necessary, the expense of which shall be paid out of the fund provided to make the improvement on James river. If any proprietor of the lands through which the canal, or any feeder may be conducted, shall believe a greater number of bridges, or bridges of a different kind, or other fencing, required for the use of his lands, than the said commissioner may deem necessary, or that they should be constructed at a different place or places from those fixed upon by the said commissioner, such proprietor, upon application to the clerk of the superior court of law for the county in which said lands lie, may obtain from said clerk, a writ in nature of a writ of ad quod damnum, directed to the sheriff of said county, requiring him to summon a jury of twenty-four inhabitants of his county, being freeholders, not related to said proprietor, or commissioner, nor in any way interested, to meet on the lands through which the canal or feeder may be conducted, on a day to be expressed in the writ, not less than twenty, nor more than thirty days thereafter; and the sheriff, on receiving said writ, shall forthwith summon the jury; and, when met, shall administer to every juryman who shall appear, not being fewer than twelve in number, an oath or affirmation, that he will faithfully, justly, and impartially, determine the matters submitted to him, according to the true meaning and intent of this act, to the best of his skill and judgment; and, thereupon, the said jury shall proceed to determine how many bridges, of what description, and what fencing may be reasonably necessary to the aforesaid proprietor, for the use of said lands, and at what places on said canal or feeder, they should be constructed, and report in writing, their finding on these subjects; which report shall be signed by the sheriff, and some twelve or more of the jury, and returned by the sheriff within ten days after the execution

of said writ, to the clerk of said superior court: *Provided, however,* That ten days previous notice be given to said commissioner of the time and place of executing said writ; and, at the next term after the return of said report, the said court, from the finding of the jury, as well as from other evidence, shall decide whether the number of bridges, their description, and the fencing, fixed by the jury, or any greater or less number, or any other kind, or any other fencing, be necessary to the proprietor, for the use of his lands; and whether the place or places fixed upon by the jury for the construction of such bridge, or bridges, or fencing, be proper; and may make such other order, touching the subject, as shall seem just and right; and the said commissioner shall cause a bridge, or bridges, and fencing, to be constructed, according to the judgment of the court; the expense of which shall be paid out of the funds provided for the improvement on James river. All bridges and fencing, to be constructed according to the provisions of this act, shall, at all times, be kept in good repair by the commissioner of the James and Jackson river canal; and the expense thereof paid out of the tolls collected on James river.

25. *And be it further enacted,* That the second auditor shall receive annually the sum of fifteen hundred dollars, and the clerk he may employ, the sum of seven hundred dollars, to be paid quarterly; one-third out of the revenues of the Literary Fund; one-third out of the revenues of the fund for internal improvement; and one-third out of the fund provided to make the improvements contemplated by this act.

26. The commissioner of the James and Jackson's river canal, shall receive two thousand five hundred dollars per annum; and the commissioner of the Kanawha road and navination, fifteen hundred dollars per annum; to be paid quarterly out of the fund provided to effect the works which they are respectively to superintend; and the persons employed by them under the authority of this act, shall be paid such compensation for their services as the said commissioners, respectively, may certify them to be worth, according to the contract made with them, to be paid as other claims arising under this act are directed to be paid.

27. *Be it further enacted,* That, in case of the death, resignation or inability to act, of the second auditor, or of either of the commissioners appointed under this act, the executive shall have power to fill such vacancy; and the person or persons so appointed, shall continue in office till the end of the next session of the Legislature.

28. *Be it further enacted,* That the second auditor shall, after his election, and before entering upon the discharge of the duties prescribed by this act, enter into bond with sufficient security, to be judged of by the executive of this Commonwealth, payable to the governor thereof, in the penalty of twenty thousand dollars conditioned for the faithful discharge of all the duties created by this act.

29. This act shall be in force from the passing thereof.

AN ACT,

Authorising the president and directors of the Board of Public Works, to loan a sum of money, to the Richmond dock company.

[Passed February 13th, 1823.]

1. *Be it enacted by the General Assembly,* That the president and directors of the Board of Public Works, shall be authorised to loan to the Richmond dock company, three hundred and seventy five shares of the stock of the Bank of Virginia, and the sum of twelve thousand five hundred dollars, payable as follows; five thousand dollars on the fifteenth day of July next; five thousand dollars, on the fifteenth day of January next, and the residue on the fifteenth day of July following: *Provided,* that the said company shall execute to the president and directors of the Board of Public Works, a lien upon all their real property, and its appurtenances, for the return of the stock aforesaid, and payment of its dividends in manner herein-provided, and for the re-payment of the said loan, in four equal semi-annual instalments; the first instalment to be made on the first day of January, eighteen hundred and twenty-eight; and that, in the mean time, the interest at six per centum per annum on the aforesaid sum of twelve thousand five hundred dollars, be paid semi-annually into the treasury, to the credit of the fund for internal improvement; and the dividends declared from time to time on said stock, to be paid in like manner; and the said stock be, at the expiration of the said credit, returned to the Board of Public Works, in kind; and that the corporation of the city of Richmond, do come under an obligationto the president and directors of the Board of Public Works, to pay to them, one-half of the loss, if any should be sustained by reason of the said loan, and shall secure such payment to the entire satisfaction of the said board.

2. This act shall be in force from the passing thereof.

AN ACT,

Authorising the Board of Public Works to subscribe for three hundred shares of the stock of the Fauquier and Alexandria turnpike company, and for other purposes.

[Passed January 13th, 1823.]

1. *Be it enacted by the General Assembly,* That so much of the act incorporating the Fauquier and Alexandria turnpike company, as directs that the stockholders in said company shall assemble at the town of Hay-market, on the first Monday in January in each year, for the purpose of electing a president and other officers of said company, shall be and the same is hereby repealed, and the annual meeting of the said stockholders for the purposes aforesaid, shall be held on such day and at such place, as a majority may fix upon within this State.

2. *Be it further enacted,* That, in lieu of the tolls allowed by the said act, the said company shall be authorised to demand and receive such tolls for passing the said turnpike road, or any section thereof, as are prescribed by the act entitled "an act, prescribing certain general regulations for the incorporation of turnpike companies."

3. *Be it further enacted,* That the aforesaid stockholders shall be authorised to increase the capital stock of said company, thirty thousand dollars; and that whenever the said capital stock shall have been so enlarged, the president and directors of the Board of Public Works shall be authorised to subscribe on behalf of the Commonwealth, (as soon as the fund for internal improvement will admit of it,) for the whole of the stock so enlarged, payable as follows; one-fourth on the first of February, eighteen hundred and twenty four; one-fourth on the first of February, eighteen hundred and twenty-five; and the balance in two equal semi-annual instalments: *Provided,* the sum so subscribed shall be exclusively applied to the making and paving of that part of the road not already paved: *Provided also,* That the said company prove to the satisfaction of the Board of Public Works, that the twenty miles of road already paved is in good order, and finished according to the provisions of the act incorporating said company, and that the fund for internal improvement shall participate with the company in all dividends (on any section being finished) in proportion of the expenditure on said section to fifty-two thousand three hundred dollars, and shall fully participate with the company in all dividends which shall be de-

clared on the whole stock in the proportion which thirty thousand dollars bears to fifty-two thousand three hundred dollars, from the time when the last instalment of the said thirty thousand dollars shall become payable.

4. *Be it further enacted,* That it shall be the duty of the Board of Public Works from to time, to appoint three directors to represent the State's interest in the stock of said company.

5. This act shall be in force from the passing thereof.

AN ACT,

Authorising the Board of Public Works, to subscribe for a part of the stock of the Fairfax turnpike company.

[Passed February 14th, 1823.]

1. *Be it enacted by the General Assembly,* That the Board of Public Works, shall be authorised to subscribe on behalf of the Commonwealth, for one hundred and sixty shares of the stock of the Fairfax turnpike company, payable in six semi-annual instalments, from the first day of February, eighteen hundred and twenty-four: *Provided,* That the stock yet due to the said company, be secured by bond with ample security residing within the State, and that the Board of Public Works shall not be required to pay the aforesaid instalments, until the stockholders in the said company, shall have paid in equal proportions of the stock remaining unpaid: *And provided, also,* That the fund for internal improvement, shall participate in the tolls received on the road from the time the last instalment is made payable, and shall have the right to appoint at least three directors to attend to the interest of the State in the said company, as soon as the president and directors thereof shall signify their assent to this act.

2. This act shall be in force from the passing thereof.

AN ACT,

Authorising the Board of Public Works to subscribe for a part of the stock of the Wellsburg and Washington turnpike company.

(Passed February 4th, 1823.)

1. *Be it enacted by the General Assembly,* That the Board of Public Works, shall be, and they are hereby authorised to subscribe five thousand dollars, to the stock of the Wellsburg and Washington turnpike company, upon such terms, and payable in such instalments and at such times, as the said board shall prescribe and direct.

2. This act shall be in force from the passing thereof.

AN ACT,

Increasing the stock of the Lynchburg and Salem turnpike company, and authorising the Board of Public Works to subscribe for a part of the stock of that company.

(Passed February 17th, 1823.)

1. *Be it enacted by the General Assembly,* That the Lynchburg and Salem turnpike company shall be authorised to increase the capital stock of said company, by adding thereto three hundred shares: and the Board of Public Works, so soon as the said company shall signify its assent to this act, shall be authorised to subscribe, on behalf of the State, for the said three hundred shares so added, payable in six equal semi-annual payments from and after the first day of February, one thousand eight hundred and twenty-four.

2. *Be it further enacted,* That the said company shall not be compelled to pave the said road farther than their funds, to be adjudged of and determined by the Board of Public Works, will admit; but the General Assembly reserve the right to apply at any future day, the tolls, to the farther extension and completion of the said road: *Provided,* That the fund for internal improvement participate in the tolls of said road, so soon as a section thereof is completed, after the payment of any part of the stock of said fund, in the proportion which the sum so paid bears to the sum actually expended on the

said road: *And provided, also,* That the said fund shall participate in the dividend declared by the said company, in the proportion which thirty thousand dollars bears to seventy-three thousand nine hundred dollars, from the time when the last payment shall become due from said fund, and that the Board of Public Works shall have the appointment of three directors to represent the State's interest in said company.

3. This act shall be in force from the passing thereof.

AN ACT,

Authorising the Board of Public Works to subscribe for a part of the stock of the Slate river company.

[Passed January 24, 1824.]

1. *Be it enacted by the General Assembly,* That the president and directors of the Board of Public Works shall be, and are hereby authorised to subsbribe on behalf of the Commonwealth for sixty-nine shares of the stock of the Slate river company, upon the following conditions, and payable as follows: one-fourth on the first day of August eighteen hundred and twenty-five, individuals in the mean time paying in the same proportion; and the other three-fourths in such proportions as shall be called for from individual stockholders, no one of which calls shall exceed thirty-three and one-third per cent. of the said three-fourths of the capital subscribed: *Provided, nevertheless,* That individual subscriptions be secured, as the act, passed on the fourth day of March eighteen hundred and nineteen, amending the act creating a fund for internal improvement, requires: *And provided also,* That the fund for internal improvement shall participate in all dividends in said works: and when the dividend of the company shall reach fifteen per cent. per annum per share, the tolls of the said company shall be so reduced as that the dividend shall not exceed that amount: *And provided further,* That the stockholders consent to the appointment of two trustees on the part of the State, of the five directed by the act of incorporation.

2. This act shall be in force from the passing thereof.

AN ACT,

To amend an act, entitled, "an act appropriating a sum of money for opening a road from Clarksburg to Point Pleasant, and for other purposes."

[Passed February 4, 1824.]

Whereas, by an act of Assembly, passed the sixteenth day of January eighteen hundred and twelve, the sum of fifteen hundred dollars was appropriated to open a road from Clarksburg to Point Pleasant, and for the erection of certain bridges; and it is represented, that in consequence of the death, and removal of several of the commissioners appointed to carry into effect the above recited act, that there remains unapplied and undrawn, two hundred and forty-nine dollars of the said appropriation.

1. *Be it therefore enacted*, That John Worth of the county of Mason, be appointed a commissioner, to carry into effect the above recited act; the said commissioner is hereby authorised to employ such labourers, or undertakers as he may think most expedient, to improve the aforesaid road by opening and clearing it of obstructions, in those parts only, which are most remote from the settlements: *Provided also*, That, if the said John Worth shall, from any cause, fail or refuse to execute the provisions of this act, the county court of Mason may, and are hereby authorised to appoint any other commissioner or commissioners, who shall perform the same duty and have the same power and authority as is by this act prescribed and given to the said John Worth.

2. *Be it further enacted*, That the auditor of public accounts shall issue his warrant or warrants on the treasury, for the sum of two hundred and forty-nine dollars, in favour of the person or persons so employed by the said commissioner: *Provided*, Such person or persons, shall produce the order of the said commissioner, and a certificate stating that such order was given, for labor done and performed, on said road, according to law.

3. *Be it further enacted*, That all acts or parts of acts coming within the purview of this act, be and the same are hereby repealed.

4. This act shall be in force from the passing thereof.

AN ACT,

Authorising the president and directors of the Board of Public Works to loan a sum of money to the Dismal Swamp canal company.

[Passed February 26, 1824.]

1. *Be it enacted by the General Assembly,* That the president and directors of the Board of Public Works shall be authorised to loan on behalf of the Commonwealth to the Dismal Swamp canal company, the sum of thirty-seven thousand five hundred dollars, payable in five equal semi-annual instalments; the first to be advanced on the fifteenth day of January eighteen hundred and twenty-five, or so soon thereafter as the state of the fund for internal improvement will permit: *Provided,* Such advance do not prevent the Board of Public Works from complying with any engagements now existing or authorised; and that the Dismal Swamp canal company do execute to the president and directors of the Board of Public Works, previous to the payment of the first instalment, a mortgage upon their whole property real and personal, as well also the nett income of all their tolls and receipts, and cause the same to be recorded in the county court of Norfolk county, to secure the payment of the same on or before the first day of January eighteen hundred and thirty, and to pay the interest thereon from the respective periods of advancing the same, semi-annually into the treasury to the credit of the fund for internal improvement.

2. This act shall be in force from the passage thereof.

AN ACT,

Authorising the president and directors of the Snickner's gap turnpike company, to alter their road, and for other purposes.

[Passed March 5, 1824.]

Whereas it is represented to this General Assembly, by the president and directors of the Snicker's gap turnpike company, that a part of the road which has been cut between the Shenandoah river and the Little river, from the nature of the ground and country through which it passes, has not conformed to the requisitions of the act relative to said road, passed January twenty ninth, eighteen hundred and ten; and that if a law were passed, authorising a change in the route, it would operate a considerable benefit to the State, and individual stockholders:

1. *Be it therefore enacted,* That it shall be lawful for the president and directors of the Snicker's Gap turnpike company to change, where they may deem it necessary, the route of their road, from the eastern side of the Blue Ridge to the Little river, taking and paying for the land and materials which it may be necessary for them to use, in the manner prescribed by the aforesaid act, passed January 29th, 1810.

2. *Be it further enacted,* That the additional time of two years be allowed to the said company to complete their road, with power to build bridges, erect gates, and to collect tolls as heretofore: and the president and directors may, where the hills are so high as to require the road to be cut eleven feet below their natural surface, dispense with side roads altogether, upon their paving the turnpike road twenty feet wide.

3. *Be it further enacted,* That it shall be lawful for the said company to collect toll for two sections of road, at one gate; but in that case, the traveller shall not be charged with toll for two sections, unless he shall pass over the same.

4. *Be it further enacted,* That the said company shall have power to collect the same tolls upon heavy waggons, independent of the teams, that the Ashby's Gap turnpike company are by law allowed to collect.

5. This act shall commence and be in force from and after the passage of the same.

AN ACT,

Concerning the road between Staunton and the Little Kanawha.

[Passed March 5, 1824.]

Whereas, it is represented to the General Assembly, that a public road from Staunton through the counties of Pendleton, Pocahontas, Randolph, Lewis and Wood, to the mouth of the Little Kanawha, will be of great public utility by promoting the improvement of that part of the State, through which said road will pass, and by reducing the amount of mileage annually paid to the members of the General Assembly, the members of the Board of Public Works, and the judges of the general court, who travel from that section of the State:

1. *Be it therefore enacted,* That a public road shall be opened from Staunton, to the mouth of the Little Kanawha, on the ground designated by the public engineer; and for the purpose of opening the same, there shall be appropriated, from the revenue arising from the county of Pendleton, the sum of three hundred dollars; from the county of Pocahontas, one hundred dollars; from each of the counties of Randolph, Lewis and Wood, four hundred dollars; which said sums shall be paid in each of the years eighteen hundred and twenty-five, and eighteen hundred and twenty-six: *Provided nevertheless,* That each of the said counties shall raise, by subscription or otherwise, a sum equal to the amount herein appropriated to such county, for the opening of said road, before such county shall be entitled to receive the appropriation aforesaid.

2. *And be it further enacted,* That, when either of the said counties shall raise and secure, by subscription or otherwise, the amount required by this act, the sheriff of said county is hereby authorised and required, to pay the amount herein appropriated, to the court of said county, and to take a receipt therefor, which shall be received by the auditor of public accounts in his settlement with said sheriff.

3. *And be it further enacted,* That the court of each of the said counties shall have the exclusive application and direction of the funds raised and appropriated by this act, on the part of the said road, which passes through such county; and each of the said courts shall have power to appoint a commissioner to superintend the execution of said work, and to allow him a reasonable compensation for his services, not exceeding two dollars for each day that he may be employed therein.

4. *And be it further enacted,* That, if either of the sheriffs of the counties aforesaid shall, after having notice by certificate of the court of his county, that the sum required by this act has been raised by subscription or otherwise by said county, fail to pay the amount appropriated to his said county by this act on or before the first day of November, in each of the years aforesaid, said sheriff shall be liable, in the circuit court of said county, for the sum which he shall have failed to pay, with ten per cent. damages, on motion in said court by the torney prosecuting for said county.

5. This act shall be in force from and after the passage ereof.

AN ACT,

Authorising the president and directors of the Board of Public Works to subscribe for a part of the stock of the Manchester and Petersburg turnpike company.

[Passed March 6th, 1824.]

1. *Be it enacted by the General Assembly,* That it shall be lawful for the president and directors of the Board of Public Works, to subscribe, on behalf of the Commonwealth, eight thousand dollars, to the capital stock of the Manchester and Petersburg turnpike company, payable as follows: one-half after the fifteenth day of January, one thousand eight hundred and twenty-five, and the remaining half, after the fifteenth day of January, one thousand eight hundred and twenty six: *Provided,* That the fund for internal improvement be placed on an equal footing with the original stockholders, and receive the full and equal proportion of any dividends which may be declared, and to which the stock standing in the name of the Board of Public Works would entitle the said Board: *And, provided, moreover,* That the sum to be subscribed by the Board of Public Works, be appropriated to the completion of that section of the road which commences at Petersburg.

2. *Be it further enacted,* That the Board of Public Works be authorised to appoint two directors to represent the State's stock in the said company.

3. This act shall be in force from the passing thereof.

* * *

AN ACT,

Authorising a loan for the purposes of internal improvement.

[Passed March 8, 1824.]

1. *Be it enacted by the General Assembly,* That the president and directors of the James River company be, and they are hereby empowered, as soon as may be necessary for the purposes herein declared, to borrow, on the credit of this State, a sum of money not exceeding four hundred thousand dollars, and at a rate of in [illegible] ding six per cent. per annum. The monies so [illegible] ll be paid into the

treasury upon the warrant of the second auditor; and, upon the receipt in the treasury of the sums so borrowed, the treasurer shall issue a certificate of stock for the amount thereof, purporting that the Commonwealth of Virginia owes to the lender, his heirs, executors, administrators or assigns, the sum loaned, together with the interest, at the rate of interest agreed on; and that the interest is payable semi-annually, at the treasury of the Commonwealth. Such certificate shall shew, on the face thereof, that the loan was made under the authority of this act. It shall be signed by the treasurer and countersigned by the second auditor, and registered in a book to be kept by him for that purpose, and be then delivered to the lender or his agent. Every such certificate of stock shall be transferrable on the books of the second auditor, and the semi-annual interest thereon shall be paid on his warrant. The principal sum authorised to be borrowed by this act, is hereby declared to be irredeemable for twenty years; but shall be afterwards redeemed at the pleasure of the General Assembly, within a period not exceeding fifteen years.

2. *And be it further enacted*, That, for the payment of the interest and the final redemption of the principal of the sums to be borrowed under authority of this act, there shall be, and hereby are appropriated and pledged, the sum of eighteen thousand dollars, out of the income of the fund for internal improvement, the surplus tolls and rents of water rights belonging to the James River company, and the nett proceeds arising from the canal and the tolls on the Kanawha road and river when completed; also, the surplus fund belonging to the said company, arising from the unexpended balances of the appropriation of eighteen thousand dollars of the revenue of the fund for internal improvement. And, if the foregoing appropriations should be inadequate to the payment of the interest authorised to be borrowed by this act, and for the final redemption of the principal, the General Assembly pledges itself to provide other and sufficient funds for that purpose. Until such other sufficient funds shall be provided by law, so much of the revenue of the fund for internal improvement, as may be necessary to supply the deficiency, is hereby pledged for that purpose.

3. *Be it further enacted*, That the monies directed to be borrowed by this act, shall be appropriated towards completing the works commenced on the Kanawha road and river, in the manner prescribed by law, and to completing the James and Jackson's River canal and the works thereon, to Maiden's Adventure falls, and to the making and constructing of a canal along the margin of James River, from the lower end of

Irish falls, in the county of Amherst, to the mouth of the North river, in the county of Rockbridge; and, so soon as the commissioner of the Kanawha road and navigation can, consistently with his present duties, he shall proceed to construct the canal from the lower end of Irish falls along the margin of James river, through the Blue Ridge, to the mouth of the North river, in all respects as is now required by law, except, that the said canal shall not be more than thirty feet wide at the top, nor more than twenty feet wide at the bottom.

4. *Be it further enacted,* That, for the purpose of ascertaining the best practicable and most expedient improvement in the navigation, from the Maiden's Adventure falls to the mouth of Dunlap's creek, and the probable cost thereof, the Board of Public Works shall cause a new survey to be made of the James and Jackson's rivers, between the points aforesaid. The survey shall be made by the civil engineer of this State, aided by some able and experienced engineer of another State, and by three commissioners, the most experienced and judicious that can be selected for the purpose. The assistant engineer shall be employed by the board, and paid, out of the revenue of the fund for internal improvement, such reasonable compensation for his services as they may contract for; and the commissioners shall be appointed by the board, and in like manner paid a reasonable compensation for their services, not exceeding five dollars each per diem. The said engineers and commissioners shall be required to make the survey and their estimates of expense with the utmost practicable care and accuracy; they shall moreover be requested to review and examine carefully the improvements on James river made, or in progress; to enquire whether such improvements have been judiciously laid out; whether the work has been well executed, and at reasonable prices? And whether any useful alterations may be made therein, and at what expense? They shall report their proceedings to the board, to be laid before the General Assembly at their next meeting. In the mean time, the civil engineer of this State shall, without delay, locate, in such manner as he may think best, the aforesaid canal between the Irish falls and the mouth of the North river.

5. *Be it further enacted,* That the said civil engineer shall, at all times, as far as may be consistent with the other duties of his office, furnish, to the commissioners of the James and Jackson's rivers, and the Kanawha road and navigation, all the aid he can in relation to the duties of their several offices: and he shall, from time to time, at least once in each year, inspect their works, and report, to the Board of Public Works, the manner in which they are executed.

6. *And be it further enacted*, That, whenever the commissioner of the James and Jackson's river canal, or of the Kanawha road and river, shall be of opinion that the public interest will be promoted by a change in the terms of any existing contract, such commissioner shall lay before the president and directors of the James river company, the contract proposed to be changed, the alterations which he conceives should be made therein, and a statement in writing of the reasons which have induced him to believe such alterations necessary. And, if the said president and directors shall be of opinion that such alterations or any of them ought to be made, such commissioner shall have power, and he is hereby authorised so to change the contract as to effect the object contemplated by the president and directors of the James river company; and the commissioner making such contract shall state therein that it is a contract changing a pre-existing contract, and that such change has been authorised by the president and directors of the James river company; and a copy of such contract shall be transmitted by such commissioner to the second auditor. And in order to prevent any failure in the payment of any such sum, which a commissioner may contract to pay on the part of the Commonwealth, the said commissioners respectively, shall, from time to time, ascertain the state of the disposable funds, and regulate their contracts accordingly.

7. *Be it further enacted*, That, if the commissioner of the Kanawha road and navigation should, in the manner herein authorised, effect a change in his contract for the improvement of the navigation of Kanawha river, from Slaughter's creek to the great falls, he shall then have full power and authority, to extend the turnpike road, now constructing under his superintendence, from the said great falls as far as the termination of the Loop creek shoals, and to pretermit all improvement in the navigation of the river above the point to which the road shall be extended.

8. *Be it further enacted*, That it shall be the duty of the Board of Public Works to report to the Legislature, at their next meeting, a proper tariff of tolls, which ought to be paid for the passage of a canal through the Blue Ridge, between the Irish falls and the North river, if such canal were made, and a proper tariff of tolls to be paid on the lower navigation, when the improvements to the Maiden's Adventure falls shall be completed.

9. *Be it further enacted*, That the Executive shall have the same control and superintendence of the office of the second Auditor, which it has over that of the first Auditor; and shall have it visited and examined in the same way; and shall have

power to remove the second Auditor for misbehavior or neglect of duty, and to supply any vacancy in the said office during the recess of the Assembly, subject to their approbation.

10. This act shall commence and be in force from and after the passing thereof.

RESOLUTIONS.

Resolution for a survey of the Mattapony river.

(Agreed to by both Houses, February 2, 1823.)

Resolved, That the president and directors of the Board of Public Works be, and they are hereby instructed, as soon as they may deem it expedient, to direct their engineer to survey the Mattapony river, from Dunkirk in the county of King & Queen, to the highest point of boat navigation, and report the best plan and probable expense of improving the same.

◆

Resolution for opening a road from the Ohio river to intersect the national road at or near the Yohoghany bridge.

[Agreed to by both Houses, January 11, 1823.]

Resolved, That the Board of Public Works be, and are hereby instructed, as soon as may be consistent with existing engagements, to direct the principal engineer to mark and lay out a road, the nearest and best route from some point on the Ohio river, between the mouth of Fishing creek and Marietta, by the way of Morgantown, to intersect the national road at, or near the Yohoghany bridge; and make report thereof, so soon as the same is completed, to the General Assembly.

◆

Resolution concerning a road from Staunton to the mouth of Little Kanawha river.

[Agreed to by both Houses, January 29, 1823.]

Resolved, That the Board of Public Works be instructed to enquire into the expediency of directing the public engineer to survey and mark a way for a road, the nearest and best way, from Staunton to the mouth of the Little Kanawha river; and if they should deem such survey expedient, that they cause it to be made as soon as may be consistent with existing engagements.

Resolution for a survey of Meherrin river.

[Agreed to by both Houses, February 4th, 1823.]

Resolved, That the Board of Public Works be instructed to direct the public engineer, as soon as his previous engagements permit, to survey the Meherrin river, from Murfreesborough to the highest navigable point on said river, and report thereon to the next General Assembly.

Resolution for a survey of Nottoway river.

[Agreed to by both Houses, February 4, 1823.]

Resolved, That the Board of Public Works be instructed to direct the public engineer to survey the Nottoway river, from the mouth of said river to the highest navigable point thereof, as soon as his previous engagements permit, and report thereon to the next General Assembly.

Resolution for opening a road from Winchester to Romney, and a road from Winchester to Frankfort.

[Agreed to by both Houses, February 4, 1823.]

Resolved, That the Board of Public Works be requested to direct the civil engineer, so soon as existing engagements will permit, to lay out and mark a road the most practicable route, from Winchester to Romney, and from Winchester to Frankfort; and that they thereupon report to the next General Assembly.

Resolution concerning a road from Romney to Clarksburg, and thence to the Ohio river.

(Agreed to by both Houses, February 15, 1823.)

Resolved, That the Board of Public Works be instructed to direct the principal engineer, so soon as they shall deem it expedient, to mark and lay out a road, the nearest and best route, from Romney to Clarksburg, and from thence to the nearest practicable point on the Ohio river, and make report thereof to the General Assembly.

Resolution of the House of Delegates directing the Board of Public Works to ascertain the best mode of improving the navigation of the Rivanna river.

(Agreed to December 9, 1823.)

Resolved, That the Board of Public Works be instructed to enquire into the most expedient method of improving the navigation of the Rivanna river, and make report thereof to this House.

◆

Resolution authorising the Board of Public Works to enquire into the expediency of subscribing for part of the stock of the Manchester and Petersburg turnpike company.

(Agreed to by the House of Delegates, December 17, 1823.)

Resolved, That the Board of Public Works be instructed to enquire into the expediency of subscribing to the stock of the Manchester and Petersburg turnpike company, and report their opinion to this House.

◆

Resolution concerning a road from the Falls of Great Kanawha to Point Pleasant.

(Agreed to by both Houses, January 1, 1824.)

Resolved, by the General Assembly, That the Board of Public Works be, and they are hereby instructed to enquire into the expediency of directing the public engineer to survey and mark a way for a road from the Falls of the Great Kanawha to Point Pleasant, on the north east side of the said river; and, if they should deem such survey expedient, that they cause it to be made as soon as may be consistent with existing engagements, and make report thereupon to the General Assembly.

Resolution concerning the survey of Harrison's Bar.

(Agreed to by both Houses, January 10, 1824.)

Resolved, That the Board of Public Works be instructed to enquire into the expediency of directing the engineer of the State to make a survey of Harrison's Bar, in James river, and report to this Assembly, as soon as convenient, the best mode and probable cost of the removal of said Bar, or so much of it as to allow ships with full freight, to pass to and from City Point.

Resolution concerning a road from Clarksburg to Point Pleasant.

(Agreed to by both Houses, January 27, 1824.)

Resolved, That the Board of Public Works be requested to enquire into the expediency of directing the public engineer to mark and lay out a road, the nearest practicable route, from Clarksburg to Point Pleasant; and, if they should deem such survey expedient, that they cause it to be made as soon as may be consistent with existing engagements, and make report thereof to the General Assembly.

DUTIES OF THE PRINCIPAL ENGINEER,

FOR THE YEAR 1823.

(*Adopted by the Board of Public Works, on the fourth day of February,* 1823.)

The committee appointed to prescribe the duties of the engineer during the ensuing season, REPORT:

That the following subjects require the attention of the Board of Public Works, in consequence of various acts and resolutions of the General Assembly, and resolutions of the Board of Public Works not yet executed.

1st. The survey between Nansemond river and Black-water river, and Summerton creek, in order to connect the two rivers by a canal.

2d. The survey or examination of the South Branch of the Potowmac, the Great Ca-Capehon river, the North river, and Patterson's creek, from their mouths to the highest point susceptible of navigation by boats.

3d. The survey or examination of Cheat and Shaver's rivers, from Jackson's works to the highest point to which it is susceptible of navigation by boats, and to ascertain the probable cost, and best plan of clearing and improving the navigation of the said river.

4th. The examination of Tygart's Valley river, in like manner.

5th. The examination or survey of the Roanoke river, (in part done, but not completed,) and of the Rappahannock river, above the falls, to the highest points susceptible of navigation.

6th. The survey or examination of Slate river, in like manner.

7th. The survey or examination of Mattapony river, in like manner.

8th. The survey and marking a road by the most direct and best route from Staunton to the mouth of the Little Kanawha river.

It will also be necessary to provide, that the engineer do attend, when required, to examine the Alexandria and Fauquier turnpike road, and the works of the Monongalia company, according to the resolutions of the Board in relation to

Your committee are of opinion, that it is advisable to direct the engineer to avail himself of all opportunities which offer, without neglecting the execution of such duties as may be specially prescribed by the board, to examine into and report to the board, the progress, condition, and mode of executing all the public works, under the management of companies with which the Board of Public Works are in any way interested.

Your committee are of opinion, that the examination or survey of the Slate river is entitled to a preference, inasmuch as a company, for improving the navigation of that river, is already formed, and three-fifths of the capital supposed to be necessary for that purpose subscribed by individuals.

They therefore submit the following *Resolutions:*

Resolved, That the engineer do, during the present year, examine the Slate river; and, if necessary, survey the same, and report what, in his opinion, is the most advisable mode of improving the navigation thereof, under all circumstances, and the probable cost of effecting such improvement.

Resolved, That the engineer do, during the present year, examine, and, if necessary, survey the South Branch of the Potowmac, the Great Ca-Capehon, the North river, and Patterson's creek, according to the resolution of the General Assembly, and report what, in his opinion, is the most advisable mode, all circumstances considered, of improving the navigation of these rivers, and the probable cost of effecting such improvements.

Resolved, That the engineer do, during the present year, if he shall be called on, and shall have time to do so, complete the survey of the Roanoke, upon the terms heretofore prescribed.

Resolved, That the engineer do, during the present year, if circumstances will permit, lay out and mark a road, by the most direct and best route from Staunton to the mouth of the Little Kanawha.

Resolved, That the engineer do, as soon as practicable, execute the other acts of the Assembly, and resolutions of the board, upon the remaining subjects aforesaid, in the order in which he may find it convenient to do the same, or as the members of the board ex-officio in the recess of the board shall direct, and in all cases of difficulty in relation to the execution of the resolutions aforesaid, in the order aforesaid, the same shall be referred to the members ex-officio who shall decide thereupon.

Resolved, That the engineer do, in preference to all other objects, (except the examination of Slate river,) and under the direction of the members of the board ex-officio, examine and report upon the Alexandria and Fauquier turnpike, and the works of the Monongalia navigation company, as prescribed by the resolutions of the board upon those subjects, whenever duly called upon to that effect.

Resolved, That, in the intervals (whenever they may occur,) between the execution of duties specially prescribed to the engineer, by the orders of the board, the principal engineer shall examine, in the order which he may find convenient, all the public works, which are under the management of any companies with which the Board of Public Works are or may be connected, or in which they may have any interest, and to report whether the work is well and properly executed or not, and to what extent, and whether the affairs of such companies be discreetly managed, or otherwise, and do give any advice or assistance in his power, to such companies, if they shall request it: and all such companies are requested to submit to the engineer, all the materials and information in their power, for enabling him to execute this duty; and this resolution is to be considered as a standing resolution, until abrogated or modified by the board.

(*Adopted the 7th February*, 1823.)

Resolved, That, after previous orders shall have been complied with, the engineer do mark and lay out the nearest and best route, from some point on the Ohio river, between the mouth of Fishing creek and Marietta, by the way of Morgantown, to intersect the national road at or near the Yohoghany bridge.

Resolved, That the engineer do lay out and mark a road by the most practicable route from Winchester to Romney, and from Winchester to Frankfort.

Resolved, That the engineer do survey the Meherrin river, from Murfreesborough to the highest navigable point on said river.

Resolved, That the engineer do survey the Nottoway from the mouth of said river to the highest navigable point thereof.

Resolved, That the duties required under the foregoing resolutions be performed in the order in which they are named, unless otherwise directed by the president and members ex-officio; and that reports in each case be made to this board.

(*Adopted the 9th April*, 1823.)

Resolved, That when the principal engineer shall attend agreeably to a resolution of this board, passed on the 4th day of February, 1823, in relation to the Alexandria and Fauquier turnpike road, that he (in addition to the duties p

Resolved. That the secretary of this board furnish the principal engineer with copies of the report and resolutions of the 4th of February, 1823, and of this report.

Resolved, That the engineer make a survey and examination of Rivanna river, and report the most expedient method of improving the same.

Resolved, That the engineer survey a route for a road from the falls of the Great Kanawha to Point Pleasant, on the north-east side of said river.

Resolved, That the engineer survey Harrison's Bar in James river, and make a report, as required by the resolution of the General Assembly of the 10th January, 1824.

Resolved, That the engineer, with the consent of the members ex-officio of this board, be authorised to change the order of his surveys, with a view to the survey of any road or river contiguous to the survey on which he may be engaged under the order of the board, or of the members ex-officio.

Resolved, That the engineer of the board attend the commissioner of the Kanawha road and river, immediately after his examination of the Monongalia navigation, or at such time as his services may be required by the commissioner, while engaged in making surveys from Clarksburg to Point Pleasant, or the falls of the Kanawha to Point Pleasant.

Resolved, That the engineer survey a route for a road from Staunton by the way of the Warm Springs to the State turnpike road at Callahan's, and any other route which, in his opinion, may be preferable for a road between the points aforesaid.

Resolved, That the engineer, under the resolution of this board, adopted on the 31st of January, 1823, examine the Fauquier and Alexandria turnpike road, and make report as therein required.

Resolved, That all resolutions of the General Assembly, instructing the engineer, through this board, to make surveys of roads and rivers, which may be passed at the present session of the Legislature, and after the adjournment of this board, be laid before the members ex-officio, by the secretary, and that the survey called for be made in the order to be prescribed by them, if in their opinion it is expedient.

DUTIES OF THE PRINCIPAL ENGINEER,

FOR THE YEAR 1824.

(Adopted by the Board of Public Works, 2d February, 1824.)

The committee, appointed to prescribe the duties of the principal engineer during the present year, REPORT:

That, at the last annual meeting of the board, a report and resolutions, prescribing the duty of the engineer, were adopted: Referring to that report, your committee find that but few of the duties required were performed within the year, in consequence of the late period at which the engineer entered upon the duties of his office.

Your committee recommend, that the surveys and examinations required by the report of the 4th of February last, be undertaken in the order therein prescribed, with the exception of the Monongalia navigation, which, in their opinion, should be first made, and at the earliest practicable day, for a thorough examination of that improvement.

In addition to these duties, it is suggested that the engineer be required, as far as may be practicable, while engaged in executing surveys, to make a topographical chart of each section of the State in which he may be employed.

Resolutions of both Houses of the General Assembly, instructing this board to enquire into the most expedient method of improving the navigation of the Rivanna; to require the engineer to survey and mark a way for a road from the falls of the Great Kanawha to Point Pleasant, on the north east side of the said river; to make a survey of Harrison's Bar in James river; and to mark and lay out a road, the nearest practicable route from Clarksburg to Point Pleasant; have been communicated to the board. It is therefore recommended that these surveys be made by the engineer.

It appears to your committee, that inasmuch as the services of the engineer are required in different and remote sections of the Commonwealth, some discretion should be permitted to be exercised as to the order in which his surveys shall be executed; and, with a view to carry into effect the objects embraced in this report, your committee recommend the adoption of the following resolutions:

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II.—7th Annual Report of the Board of Public Works, 15th December, 1822.
III.—8th Annual Report of the Board of Public Works, 1st December, 1823.

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